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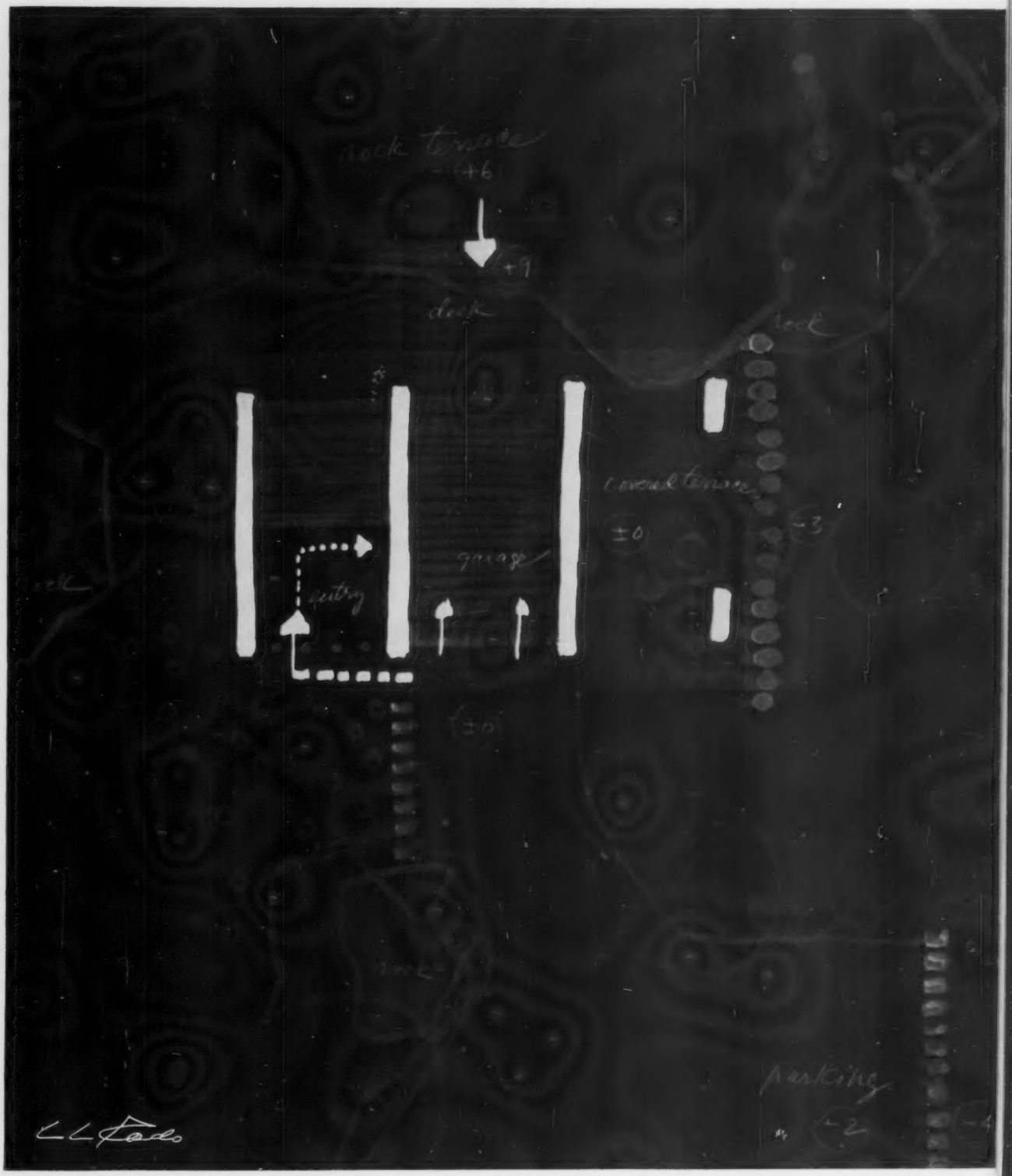

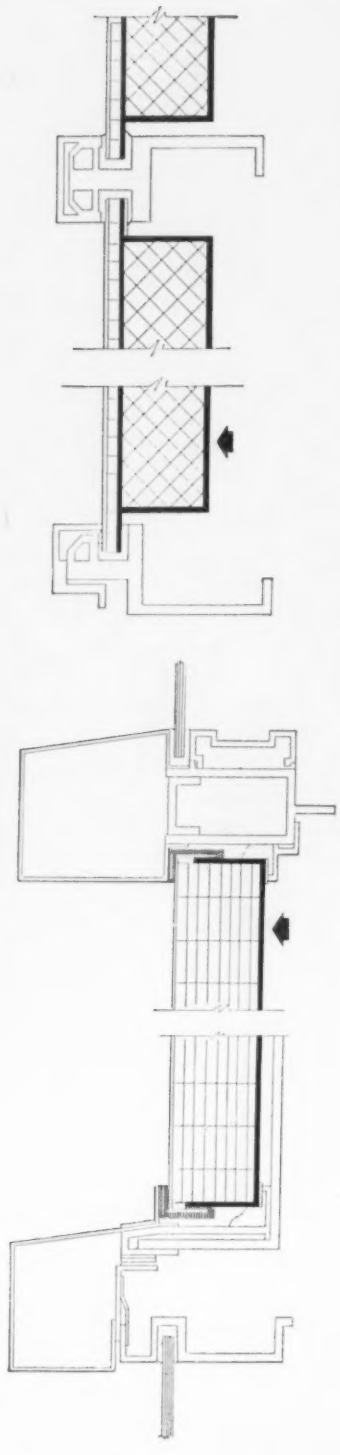

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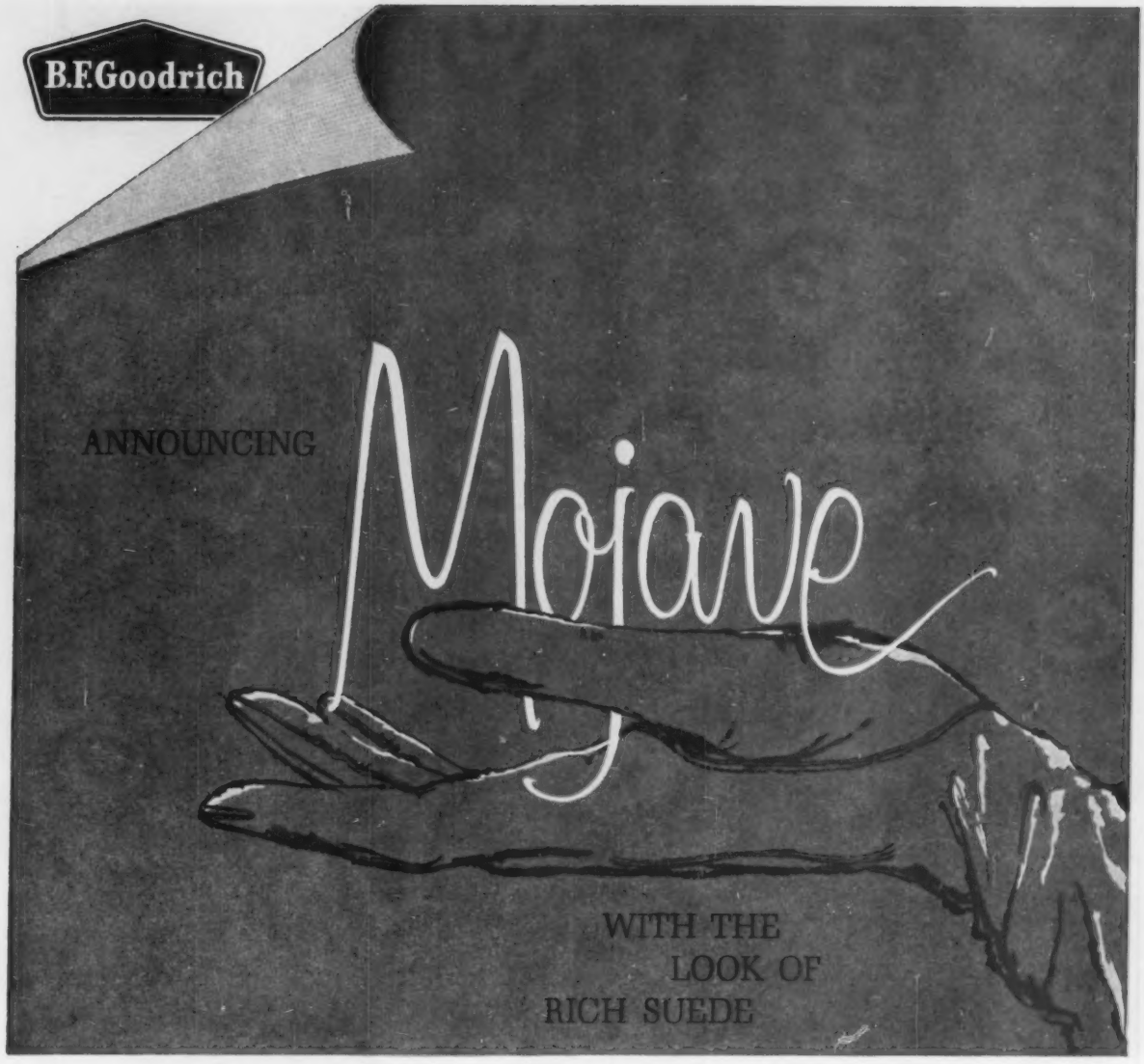

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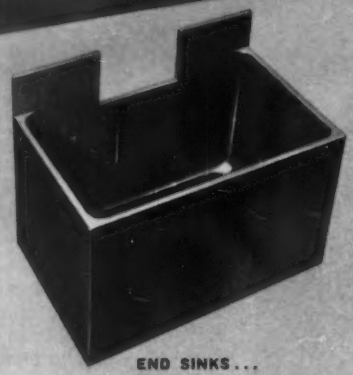

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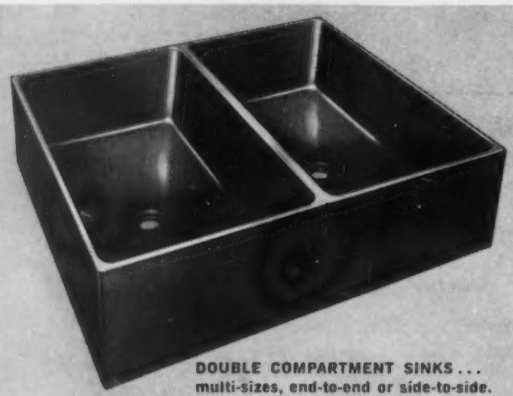

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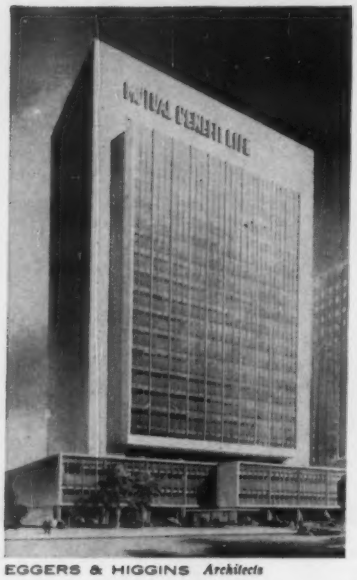

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Exclusion of "Unqualified and Incompetent" from Practice

It's the Law Column by Bernard Tomson and Norman Coplan

P/A Practice of Architecture *article exploring the legal safeguards provided for protection of architects.*

Exclusion of the unqualified and incompetent from the practice of architecture and engineering is generally dependent upon the scope of the licensing law of the state concerned, and the quality of its enforcement. It is possible, however, for an apparently effective law to be diluted by judicial construction. For example, the Pennsylvania Superior Court has construed the architectural licensing law of that state to prohibit the use of the title "architect" by an unlicensed person, but otherwise to leave the practice of architecture relatively unrestricted. This interpretation seemingly nullified the express language contained in the statute which provided that "in order to safeguard life, health, and property, no person shall practice architecture . . . or engage in preparing plans and specifications or preliminary data in the erection or alteration of any building or use the title 'architect' . . . unless such person shall have secured from the Board a certificate of qualification and registration . . ." (*Baker vs. Chambers*, 183 Pa. Super. 634, 133 A. 2nd 589).

The interpretation of the Pennsylvania licensing law by the Superior Court arose out of a case instituted by a corporation against a property owner who had employed that corporation to furnish architectural services in connection with a contemplated alteration of the property owner's home. The president of the plaintiff corporation was a registered engineer, and the corporation had an architectural department which it maintained as an adjunct to its engineering business. The head of the architectural department (a licensed architect whose compensation was measured by the architectural commissions executed by him) prepared the preliminary plans, but the project was abandoned because of excessive cost. The owner refused to pay the plaintiff corporation for the services rendered by its employe, and the corporation instituted suit to recover its compensation under its contract with the owner. Despite the fact that a corporation cannot qualify for registration to practice architecture under the Pennsylvania statute, the trial and appellate courts held that the corporation was entitled to recover its fees because it had not held itself out as an architect or used that title and was, therefore, in compliance with the law. This determination was made despite amendments to the licensing law which had been enacted in 1939, many years prior to this decision, and which seemingly had transmuted the Pennsylvania licensing law from a "title" statute to a "practice" statute.

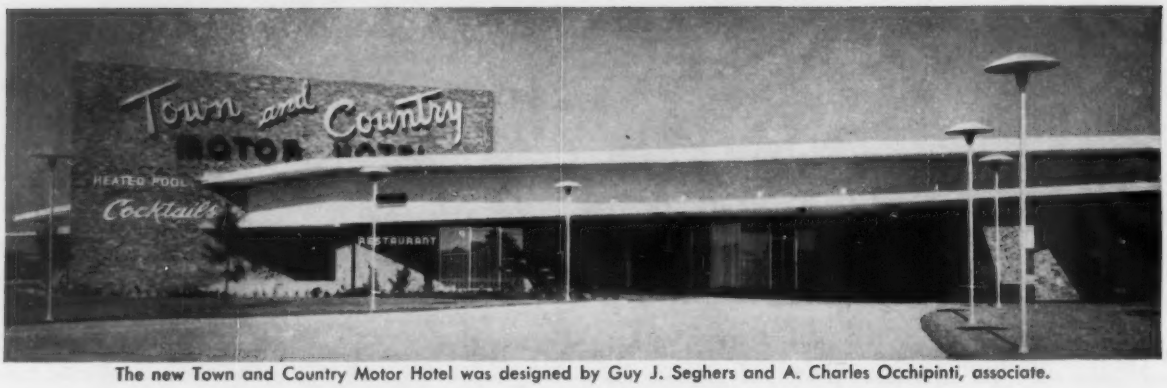
The Pennsylvania licensing and registration law applicable to architects was first adopted in 1919. This law as amended in 1933 provided for the examination and registration of architects and stated that "it shall be unlawful for any person . . . to enter upon the practice of architecture in the State of Pennsylvania, or to hold himself or herself forth as an architect, or as a registered architect . . . unless he or she has complied with the provisions of that act." The licensing law, however, contained a further proviso that it should not be construed "to prevent persons other than architects . . . from designing buildings and supervising their construction provided their drawings are signed by the authors with their true appellation. . . ." The statute containing this proviso was construed as prohibiting only the use of the title "architect" by unlicensed persons, and to otherwise permit the practice of architecture by corporations, builders, carpenters, etc., as long as their true occupation was indicated on the drawings.

The 1939 amendments, however, to the Pennsylvania licensing law significantly struck out the proviso in the original law which had permitted persons other than architects to design buildings provided their drawings were signed with their "true appellation." Except for certain minor exceptions which were added to the law by the amendatory act of 1939, the statute, by its terms excluded all unlicensed persons from practicing architecture. The Superior Court in the *Baker* case, none the less, concluded that the 1939 amendments had not altered the substantive application of the law.

In justification of its decision in the *Baker* case, the Superior Court did not discuss the legislative intent in adopting the amendatory act of 1939 but rather, relied upon an earlier decision which had been made in 1940 subsequent to the 1939 amendments, but involving events which had occurred in 1933. The earlier case (*F. F. Bollinger Co. vs. Whidman Brewing Corporation*, 14A 2nd 81) was an action by a corporation to recover compensation for plans and specification which had been prepared for the rehabilitation of a brewery. The court found that the corporation had held itself out as an architect, and thus violated the licensing law. In denying a recovery to the corporation, the court discussed the provisions of the licensing statute as it was worded prior to the 1939 amendment and referred to the decisions construing such statute including those decisions which had ruled that non-licensed persons may practice if their true appellation is set forth in the drawings. No reference was made to the 1939 amendments, as they were not involved in the case and could not affect acts which took place in the year 1933.

However, 17 years later in the *Baker* case, the Superior Court in referring to the *Bollinger* case stated that the court in that case had quoted earlier cases "with approval as the law even after the 1939 amendments to the act" and thus drew the conclusion that the Pennsylvania Supreme Court in the *Bollinger* case considered the application of the law substantially unchanged in 1940. This conclusion is highly questionable in view of the fact that the Pennsylvania Supreme Court in the *Bollinger* case was applying the licensing law as it applied in 1933, and had no occasion to determine the effect of the 1939 amendment.

It is not uncommon for legislative changes in licensing and registration laws to be regressive in approach and to weaken rather than strengthen the restrictions upon practice of architecture by the unqualified. Where, however, the legislature has been induced to provide more stringent requirement for the practice of architecture or engineering as a protection to the public, it is unfortunate that such efforts are diluted by judicial interpretation. In any event, the *Baker* case is illustrative of the continuing need for the profession to press for adequate and uniform legislation in this field.



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What's Wrong With The Schools?

by Frederick L. Langhorst

P/A Out of School ***article discussing present trends in architectural education, by a distinguished practitioner who has interrupted his career in architecture for several years to travel, observe, and lecture.***

I am convinced, after an academic year of visiting nearly a third of our architectural schools for lectures and teaching, that the training of an architect is a most complex procedure—much more so, I believe, than most other academic efforts to qualify students for their chosen professions. I am awed by the mass of new material the students in Science must master to make a start, and by the extra background needed now for Economics and Business Administration, Medicine, and Law. Complexities exist all through our teaching system, but in any area of factual advance that is patently demonstrable, the student mind can be directed along a path of some certainty. Architecture is enough removed from this factual world of thought by its relation to the Arts, Psychology, and the expression of spirit to make any formulated training an ephemeral thing indeed.

Probably the core of the dilemma lies in the shifting scene of our own hectic present. What end results do architects themselves want to produce? Without knowing this, it's difficult to see how much more than the technical side of construction can be safely formulated as of positive value in a curriculum. Some schools attempt to stick to "fundamentals" as though these were somehow static, and try to keep at as great a distance as possible from their students any "Great Man" influence. And yet, others encourage close study of the leaders of our times, choosing one or another for a partisan loyalty.

At Georgia Tech, we saw the *Architectural Forum* film on the status of mid-century U.S. Architecture. Eero Saarinen most ably states the theme—three vocabulary builders for a new synthesis: FLW, Mies and Corbu—and then these and other individuals are presented with more of a diversity of emphasis than any one could believe possible to synthesize. Noble as the effort is, it leaves students (school-age or serious-minded practitioners) with a confusion that presently pervades the air of architecture. This is not to detract from the value of the film. As a reportorial essay it is to be commended, but the fact that the synthesis remains for new genius to achieve is, it seems to me, made abundantly clear.

Thus the schools labor in an effort to be "fundamental" while the flux of new concepts seems to range in orbits just outside their reach.

The lectures I have given with slides on the great versatility of Frank Lloyd Wright were welcomed almost avidly by most students, and yet faculties were, in general, cool, as though this might still upset the "Fundamentals." I have too little material on Mies to attempt a lecture on his work, but having visited the Seagram and IIT buildings, have a wholesome respect for it. I found opposition by some students to the discipline of Mies, which, it seemed to me, was obscuring their appreciation of the artistry in it; as in the case of FLW, that must also be seen above prejudice. Corbu, being a little more removed from the U.S. scene, is, even so, a great inspirer, and his new work in free form gives students almost a holiday from "Fundamentals." Unfortunately, however, most of this influence, also via South America, is more of a form-and-shape thing than the real study of his concepts.

So much for the three big influences—except to say that they are not, any one of them, understood thoroughly enough (with the possible exception of Mies, in some schools which I didn't get to visit). They all made new and very profound demonstrations of how architecture can grow. As points of departure for the coming work, they must be studied as masters more vital than those of more remote history.

The one common denominator of "dream-boating" in design in all the schools I saw seems to have left out of the *Forum* film as I remember it. That is the influence of Nervi, Torroja, and Candela. It has reached the inner sanctum of student idealism almost universally, sometimes in defiance of any professorial caution. The idea of intuitive engineering leads all the followers of these creative men to feel a new "value" for architcture. The "how" is somehow to be left for the technician-engineer to cope with, but the result will be glorious —or at least different, and possibly sensational!

At this point one wonders where the "fundamental" approach really continues in some schools. True, the design problems should be "imagination stretchers" (just as some say calculus is necessary as a brain stretcher—though Ludlow Brown, who teaches Structure at Cornell, said he thought a one-semester, three-hour course could cover what an architect needs to learn about this language of variables and summations of miniscule actions).

I asked of one Engineering Department how many Bachelor's Degree students were given thin shell and cantenary studies. The answer was: "None!" How much for a Master's Degree? "Very little!" For proficiency in such design were there many PhD's? "Not many!" It would seem that the hopes of many students aspiring to design in these new shapes may be cut short by the lack of engineers to solve their problems. One point of hope was expressed that for some of the more regular forms there may be a "break-through" to computing machine techniques. It would seem about time.

To return to the point of the complexity of architectural training—I use this term to express the feeling for the confusion sensed in many students that probably comes from the compartmentalism of the aspects of architecture into courses; each a subject as though without a predicate and, worse, with no verb to make a sentence. They trust the academic system ultimately to tie all these

(Continued on page 11)

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What's Wrong With The Schools? (continued)

subjects together, and yet too often they remain unrelated. The transference of material from one course to its application in another is too seldom made.

It seems that the fundamentals are in need of an overhauling, which might well start with a new view of the History of Architecture, not as just the remote past, but up to yesterday—even the last hour. The factor common to remote or recent past that needs a strong emphasis is its value as experience. As history is developed in this way it is valuable to training for what may be coming. History treated as a "subject" is one of those exercises that might be looked upon as a "knowledge-for-its-own sake" stretcher, and it can become a dreamy sort of other world. It's easy to fall in love with a romance of the past. We've all done it at one point or another, if just in traveling. But a philosophy for action is one demanding both the history and the wisdom to see where principles apply for tomorrow. This is not easy, but the architect as a responsible builder in his own culture must be a very broadly based individual. He must know how to interpret and make a transference. An example I saw in a number of schools is that of abstract design. Much of it is commendable. One explanation made is that students come from such varied backgrounds that to give literal problems—such as a meeting hall, etc.—would be rich for one and poor for another—so, to see the basic values of lines, planes, and volumes, it is best to remove them from immediate reference. In principle this is valid—yet when literal problems follow, somehow transference is lacking. Like history, the penetration to purpose is lost in the test tube.

The most shocking thing of all about the design training today seems to me to be the detachment from reality—and by reality I mean the exprience of a final building. Most architects who have grown through their practice will testify to the validity of learning continuously from the experience of a "full-scale" rendition of their design concept. Too many architects walk away from a completed building satisfied to repeat the same performance, but real architects study their work to see where they can improve. The student can't see his "project" in actuality—it's a paper thing. He gets a judgment on it—a grade—and on a summation of grades he graduates, to have to learn through experience in work about the reality of buildings.

Paul Heffernan let me try an experiment at Georgia Tech which was simply this—for the class to visit five buildings and to have everyone make a sketch onsite of the aspect of each building which impressed him the most—orientation, entrance, material-use, structure expression, circulation, esthetic response of space, etc.—and of these good or bad. Then we had a couple of days of discussion, each defending his sketch and seeing and hearing about others. Then we went to see the five buildings again with a discussion *in situ* and a second set of sketches. Through this exercise in seeing and feeling these buildings, we hoped that some better realization of space values would be felt in following design projects. The paper approach needs to be augmented by a continuous curiosity about *what* is being drawn.

It must be realized in the over-all complexity of architecture that it is a two-way street. Buildings are not ends in themselves. They are for the use of people—human beings who have subconscious reactions. Some of these reactions are as much conditioned as those of Pavlov's dogs, whose mouths watered when he rang a bell and fed them—and later when he just rang the bell. The old eclectic work of Gothic for churches, and Greek for banks, was out of this "conditioned" background. Today we have revolted against eclecticism and would design new forms, but we still follow the leader, even when we are not aware that we do so. This makes the problem of "style" and "fashion" a mystery to students. For a deep look into the causes for human responses, I believe we could very well study the techniques used by advertising as explained by Vance Packard in his book, *The Hidden Persuaders*, to see what motivational research via psychology has to do with architecture. In this field we have problems of our response to all the old names: scale, color, rhythm, and pattern, and some new ones: motion and empathy. These are the return directions on the two-way street on which it seems to me we are going only one way. Possibly this is why so many architects can talk best to one another and why only a few can talk successfully to their clients. In medicine, doctors speak of the "bedside manner." Now they have the aids of interneship and of psychiatry while architects still live in a world of a degree and a license, both 50 years behind medicine and a good 10 behind the Madison Avenue boys.

Unless the practice of architecture reaches higher levels of understanding by the people it aims to serve, the schools will continue to have the present great difficulty of starting the student in architecture.

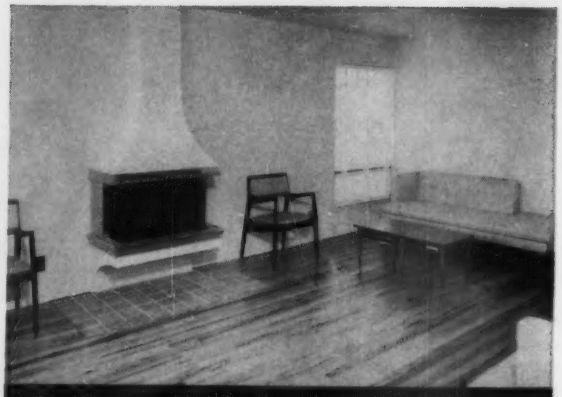
And this leads to a last observation. Teaching architecture requires, I believe, an awareness of all of the above and some experience in realization of design in construction—yet the schools have so many who are academicians—graduates with degrees — Fulbrights, Guggenheims, etc.—without adequate understanding of the real work of fulfilling a commission for an actual building.

All of this leaves out planning and relation to the other arts and landscape architecture and industrial design. All of these are part of the environmental world we live in and schools of architecture must be broad enough to make their students realize this broad pattern.

Returning again to the theme of complexity, I would hide behind this refuge because I don't know the answers. I do know that most young people are eager and trusting. Many take on their studies for a degree in architecture in a conformist way, and something much better should be done for them.

for the new Air Force Academy buildings, only highest grade materials were chosen, including Hillyard seal and finish for well over one million square feet of wood floors.

Besides appearance, the architects were concerned with longtime protection against wear, efficiency of application and ease of maintenance. A Hillyard Maintaineer served as "Job Captain" without compensation, while the floors were being finished. Architects: Skidmore, Owings & Merrill. Flooring Contractor: Superior Floor Co., Colorado Springs.



Hillyard treatments were chosen for oak floors in 1200 units of Capehart housing; for instructors and support personnel.

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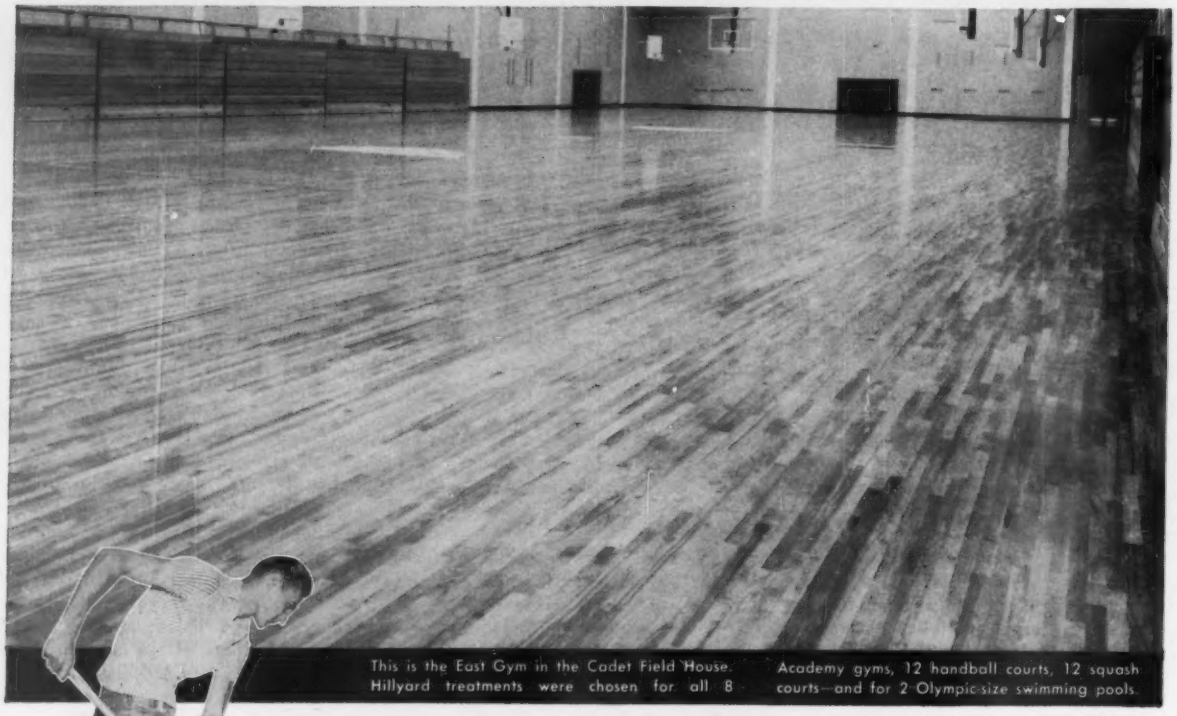
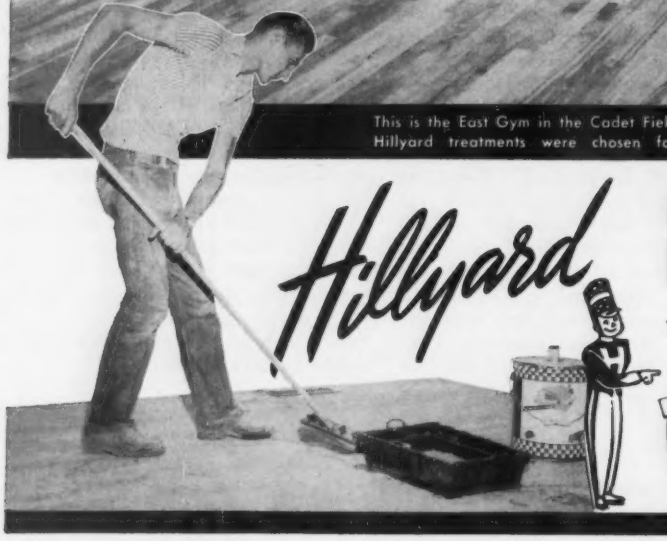


This is the East Gym in the Cadet Field House. Hillyard treatments were chosen for all 8 Academy gyms, 12 handball courts, 12 squash courts—and for 2 Olympic-size swimming pools.



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Concrete Finishes for Resilient Flooring

Specifications Clinic by Harold J. Rosen

P/A Practice of Architecture ***article dealing with a major problem encountered in construction of high-rise office buildings: producing satisfactory concrete floors of uniform wearing quality, and finishing concrete floors to receive resilient floor coverings.***

This column is generally devoted to aiding Architects and Specifications Writers in preparing specifications, by keeping them abreast of the latest developments in materials and recommending certain practices. However, in this month's column, I am compelled to enlist the services of my readers in seeking a solution to a problem which I have encountered as a member of a committee on concrete floors, fills, and finishes of the Concrete Industry Board of New York.

It seems that a major problem encountered today in the construction of high-rise office buildings is: producing satisfactory concrete floors of uniform wearing quality, and finishing concrete floors to receive resilient floor coverings. The difficulty stems from the fact that our highly technological age has introduced many mechanical elements, essential to the swift conduct of business, which are embedded in floors; i.e., electrical conduit, intercom wiring, telephone raceways, heating and cooling elements, etc. Embedding these elements within the structural slab would seriously reduce the strength of the slab; therefore, they are placed in lightweight concrete fills averaging from 2″ to 3″ in thickness.

While many materials can be used for floor fill, the number that can be satisfactorily finished to receive resilient flooring are few. Although regular cement-sand-grits mixtures can be used as both fill and finish, there can be considerable savings in weight and consequently a savings in framing members in multi-story construction if part of the fill can be lightweight.

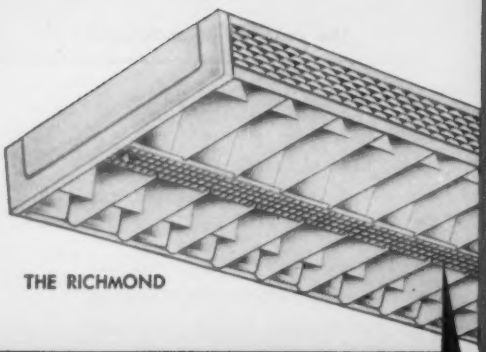
It is in this use of lightweight-concrete fills over structural-concrete slabs, and cement-sand-grits toppings over lightweight-concrete fills that one encounters the problem. The problem is one of failure of the floor to bond properly, for the topping to curl away from the lightweight fill, and to have low wear resistance. Despite the many specifications that have been written covering concrete-floor installations, the finished concrete floor can vary considerably and there is no assurance that two floors, placed under apparently similar circumstances and conditions, will produce equally satisfactory results.

The Committee on Concrete Floors, Fills, and Finishes of the Concrete Industry Board of New York had been assigned the task of writing a manual of recommended practices for concrete floor finishes. In preparing the manual for various types of floor finishes, such as monolithic finishes, separate toppings, integral toppings, heavy-duty floors, etc., and in discussing the possible solutions to the placing of toppings on lightweight fills, it became apparent that there was an absence of basic scientific and laboratory information on this subject.

The Committe has sought information from several sources, but the replies have indicated that there is no simple or acceptable solution to the problem. It has been suggested that rich cement plasters and stuccos perform poorly when applied over base coatings of much weaker mortars or plaster, and that there is evidence that some underlying cause is involved—namely that strong, brittle coatings which undergo shrinkage upon drying, experience a substantial part of their unrestrained movements resulting from drying shrinkage unless they are bound firmly to a backing of at least equal rigidity. It has also been suggested that lean lightweight-concrete used as floor fills not only has lower modulus of elasticity than the cement-sand-grits toppings, but also has a much lower strength and therefore some of the loosening of the topping is caused by fracture of the fill.

Others have indicated that the floors be completely bonded or the topping should be completely separated. Complete separation means a separate topping having no bond to the lightweight fill, but this would require a topping 2″ to 3″ in thickness, reinforced with light-wire mesh, and the additional weight would offset any advantage gained from the use of the lightweight fill. To achieve bond, it would be necessary to use a long curing period to minimize volume changes during the early stage. However, if the topping is strong enough to resist early drying shrinkage, it may attempt to curl at a later date.

At the moment of this writing, the Committee has no pat answer to this problem and will welcome any assistance. Recommendations should be forwarded to: The Concrete Industry Board, Inc., 220 East 42nd Street, New York 17, N. Y.



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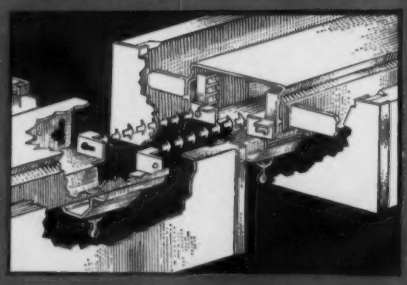

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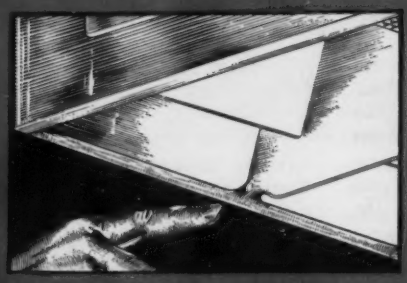

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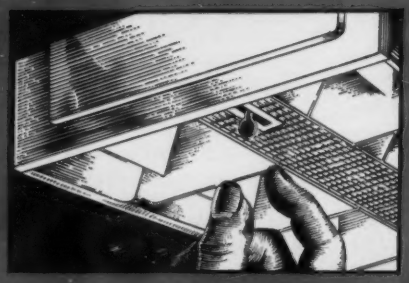
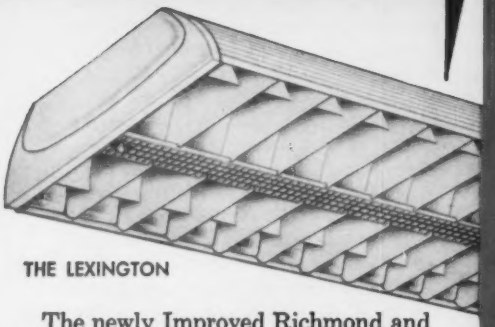


Shielding assembly is securely locked in position (or lowered on safety chains) by quarter turn of visual action thumb latches.



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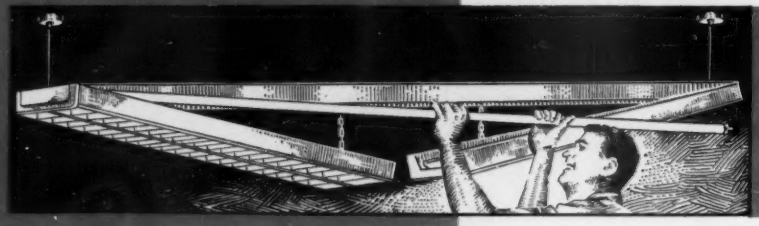
For complete catalog information write Dept. RL-119. For a physical demonstration of these outstanding fixtures, contact your local Miller Representative.



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Centralized Utilities for Headquarters Complex

Mechanical Engineering Critique by William J. McGuinness

P/A Practice of Architecture *column on mechanical and electrical design and equipment, devoted this month to the long range planning of centralized utilities for an office building complex.*

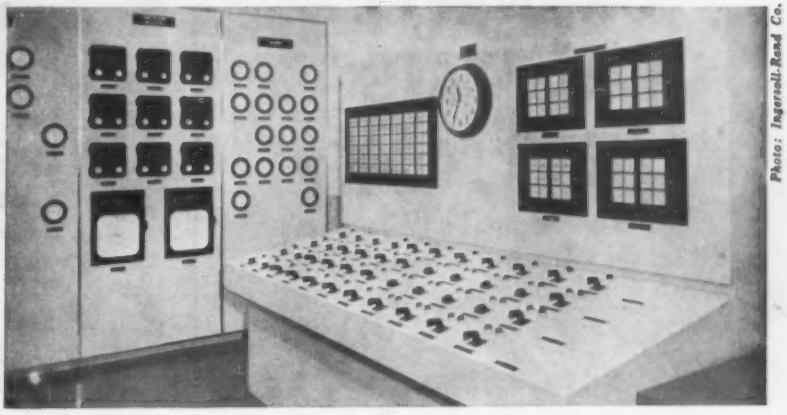

Photo: Ingersoll-Rand Co.

Control room has console with control switches for pumps, fans, and other equipment. Annunciator panels report cooling and heating requirements in each building, computor-area humidity, tower water temperature, and other data.

A new utilities building has been created to centralize the heating, air conditioning, and other services for The Ohio Oil Company's fast-growing headquarters buildings at Findlay, Ohio. The objectives are to improve service, increase efficiency, and reduce maintenance. Designed by the firm of Wilbur Watson Associates of Cleveland, the building and its equipment are an impressive example of long-range planning, tying-in systems planned in the past, and providing facilities to meet future needs.

The Ohio Oil Company, organized in 1887, now operates 3600 miles of pipeline for the transportation of crude oil, and is a producer in the United States, Canada, Alaska, Venezuela, and Libya. It explores for oil both in the Americas and Africa. At Robinson, Illinois, the company refines 50,000 barrels a day. Total crude oil production is 100,000 barrels a day. These operations and an expanding program of marketing have required similar expansion in headquarters at Findlay. Successive increases there have been controlled to provide an architectural and functional entity. Since 1929, Wilbur Watson Associates have guided the planning of this cohesive, administrative community. By 1958 the complex comprised 360,000 sq ft; currently 285,000 sq ft are being added; provision for a future addition of 270,000 sq ft is also being made.

In the 30-year master plan, it was the intention that all mechanical and electrical services would be centralized and housed in a single *utilities building*. This unit was built in 1958 and joined at that time to the electrical and mechanical services of existing buildings long planned for the connection. Its burden will be doubled by 1960. Empty areas will receive equipment for an augmented capacity to serve a future demand three times as great as that of 1958. The building is a two-story, fireproof steel and masonry structure 114′ long, 50′ wide, and 37′ high. Exterior is brick, interior concrete block and glazed tile. Floors are quarry tile on the first floor, plus vinyl on the mezzanine and second floor. From this center emerge the hot water, chilled water, steam, gas, and electricity to meet the diverse needs in the various buildings. It houses boilers, converters, refrigeration machines, control center, pumps, and other equipment. Above it are cooling towers to serve the refrigeration machines.

Changes in mechanical planning over the years are reflected in the new plant which is designed to cope with the old, the new, and the future. With steam as its prime power source, it supplies this medium at reduced pressures to heat the older buildings through their steam radiator systems. Other steam leaving the utilities center is used for cooking, humidification and fresh-air tempering. The newer buildings utilize warmed and chilled water. These are both conditioned within the center, respectively, by shell-and-tube converters and by absorption-type refrigeration machines. Steam also heats the domestic hot water. About 90 percent of the steam condensate is returned to the boilers. The switch from steam to circulated hot water, the advent of circulated chilled water, the necessary pumping of condenser water to and from the towers, and other recent developments have made an interesting change and increase in the pumping requirements of this kind of station. Here 25 pumps circulate or deliver water or solutions in the following nine systems:

Hot water for heating
Chilled water for cooling
Domestic hot water
Domestic cold water
Condenser cooling water
Boiler feed water
Condensate return water
Ethylene glycol solution (snow melting)
Water for fire protection

Part of the second floor of the utilities building is a fireproof transformer room for the entry and distribution of electricity. It is distributed at 4160-v to each floor of the headquarters building. This high voltage reduces the transmission losses. Utilities building transformers step down voltage only for lighting and equipment within the building.

All services drop down one wall of the utilities building and are carried to other structures through ample 14′ x 9′ tunnels.

A control room, glass-enclosed and air conditioned, provides a center from which an operator (there is always one on duty) can observe temperatures and other conditions in all parts of the system. Here, too, are controls for starting and stopping all equipment except the boilers. Failure or an unfulfilled need anywhere in the system sounds a buzzer and lights a square on an annunciator panel to indicate the problem or action required. It could be anything, from failure of d-c power supply or low humidity in the computer room to a need for more cooling in the Marketing Building.

The Company has found that long-range planning and top-quality equipment are not a luxury, but actually bring reduced maintenance costs and more efficient operation.

Gratitude is expressed to C. W. Lyon, Supervisor, Building Construction and Maintenance Department. The Ohio Oil Company, for technical information included in this article.

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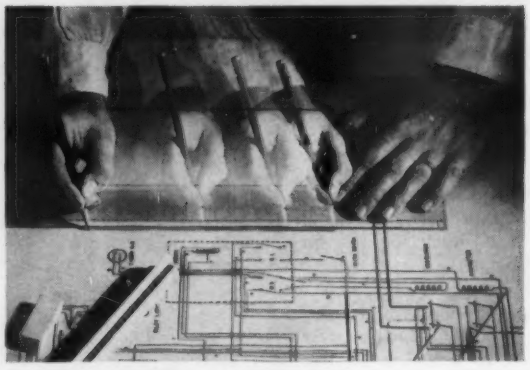
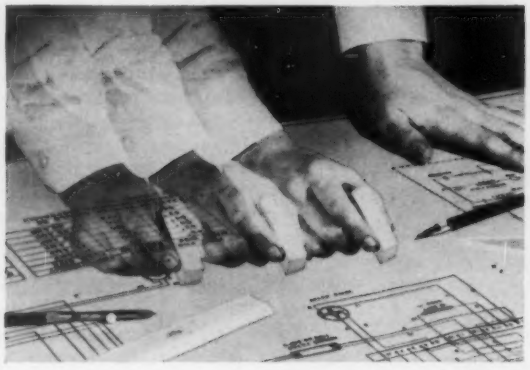


2 CRONAFLEX Drafting Film erases easily, without ghosting, yet there is less smudging. It comes matted one or two sides, and is available in either rolls or sheets.



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This means that every sheet of CRONAFLEX Drafting Film has the same excellent pencil acceptance, the same erasability, the superb matte surface, the .004" thickness which has been found ideal for drafting and filing.

If drawings are made anywhere in your operation, you can use CRONAFLEX Drafting Film to great advantage. CRONAFLEX Drafting Film joins the widely acclaimed CRONAFLEX line of films: Direct Positive, Contact and Projection. You can go from original drawing to final reproduction with the same product line on the same strong base. For more information write: E. I. du Pont de Nemours & Co. (Inc.), Photo Products Department, Wilmington 98, Delaware. In Canada: Du Pont of Canada Limited, Toronto.

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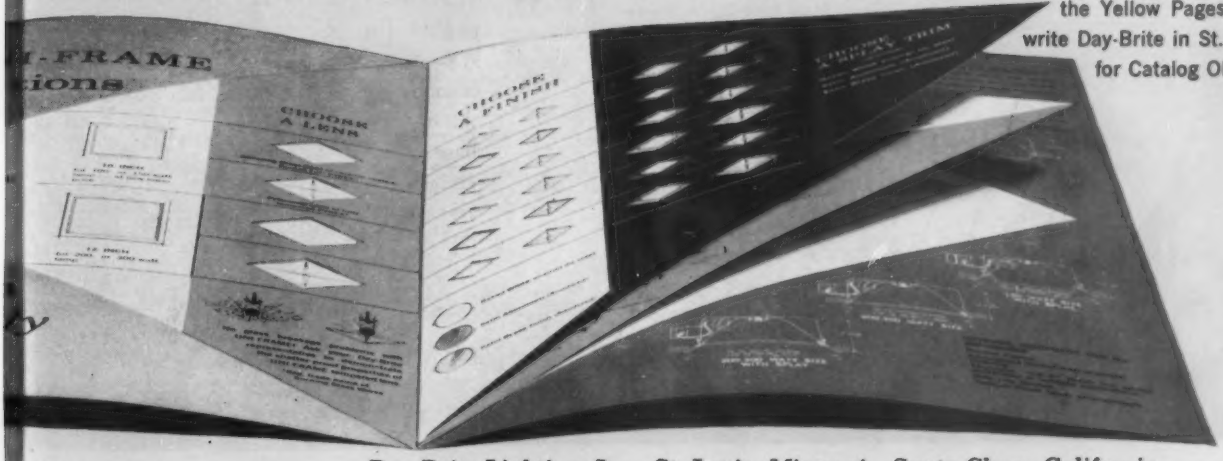

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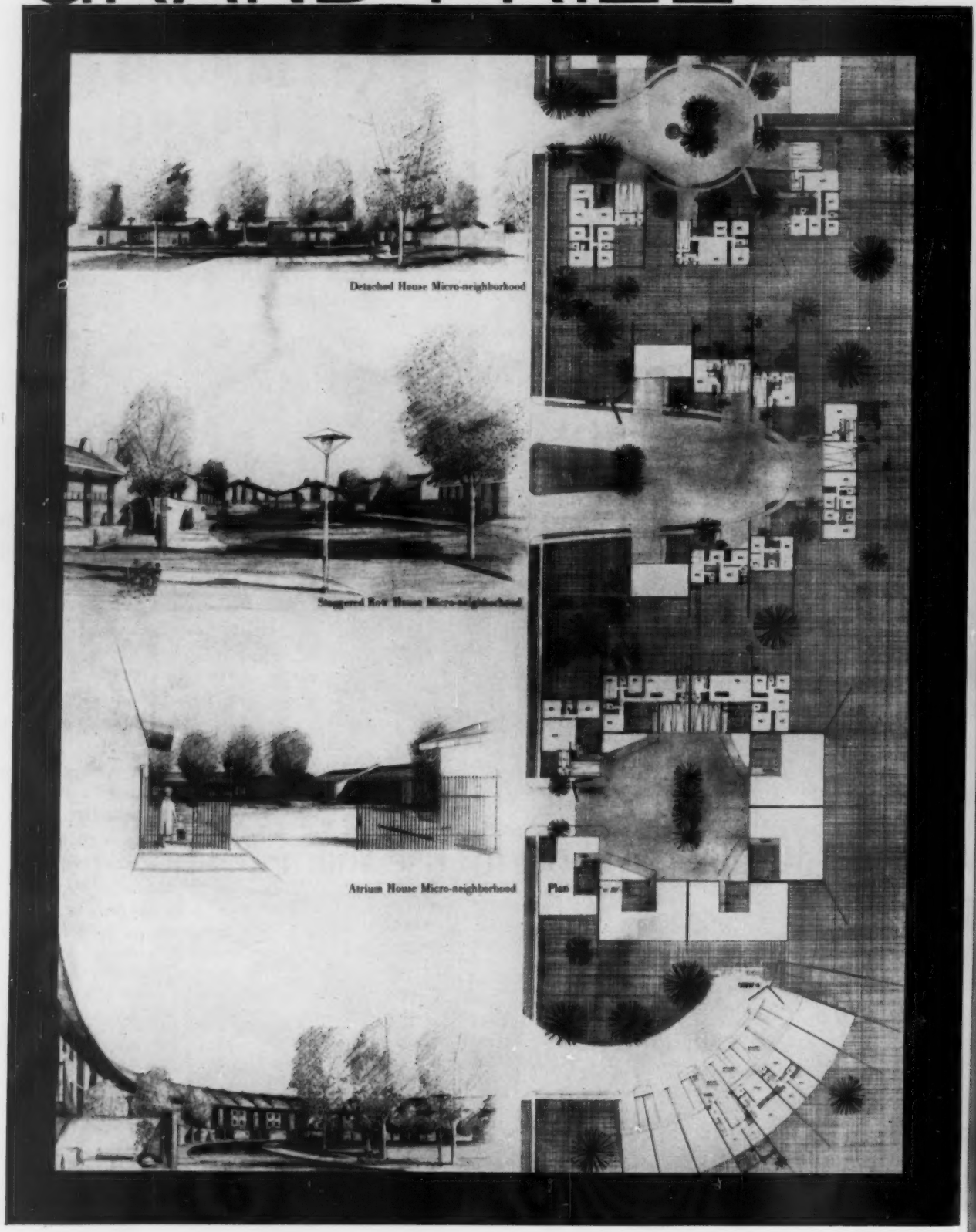

Annual Design Competition

CONCEPT

A major need in tract housing today is to express the small town community of the past in a new form. First, to better relate the individual home to its neighborhood community environment:

- We create a community of micro-neighborhoods sharing certain desirable facilities in common. Each of 56 micro-neighborhoods is located on a cul-de-sac with an average of ten homes. No home faces a circulation street. This makes possible the pedestrian environment essential to good family living where children's safety is primary. Common neighborhood areas are reached by crossing at most one circulation street.
- A variety of things to do are provided within the neighborhood. Pedestrian walks lead through "Small Stream Park" to small playgrounds, sports facilities, the community "country club," "general store" concession, bus stop, a late hour convenience grocer, and toward schools, churches, and shops.
- For the automobile, a circulation loop links micro-neighborhoods, community facilities, and access highways.
- The two small store concessions are conceived to help focus the neighborhood internally, and help support the community facilities.

To encourage more individual expression in ways of living we offer four housing types to appeal to varied age groups:

- One story individual homes grouped in micro-neighborhoods of different sizes and character comprise seventy percent of the development.
- Three types of row houses also grouped in micro-neighborhoods, are designed to afford economy of construction and land use. (See ledger.)
- Each type of housing is characterized by a private area for outdoor living. In the row house a front courtyard provides a transition from the street to house, and is also used to handle the automobile.

To create a visually appealing environment:

- We propose a comprehensive plan for community appearance. The municipal planning board is assumed to have special zoning powers to adopt this plot which will make the location and arrangement of building binding. These special powers under state enabling legislation are in existence in such cities as New York. They provide that where there is an adequate plan, ordinary zoning rules may be waived.
- To foster pride in the development, and to sustain it as a unity, we propose that deeds include ownership shares in a neighborhood corporation. This corporation shall own all common land, community buildings, and other community improvements, and maintain all private as well as community trees and lawns. An annual assessment of $30.00 per family will cover building maintenance and labor costs for five employees, each at a salary of $3000.00 per year.
- A sequence of spaces and vistas unifies the entire development. Both public and private spaces are organized by building masses, heights, and building lines, and by walls and tree patterns to encompass all things seen from the public way. "Vista easements" are provided for public enjoyment.
- A unity of form is achieved throughout the development with simple gable roofs of varying pitches.
- Within each micro-neighborhood a substantial portion of all structures shall be of the same material. Individual character in the micro-neighborhood is obtained with its building material, mass arrangement and special plants or sculpture as the focal point of each cul-de-sac.
- A special sidewalk pattern, street lamps, or other "street furniture" will contribute to the distinctive character of the development.
- The neighborhood is defined from the exterior with a landscaped fence zigzagged at a scale to be comprehended by speeding motorists, and by vistas from highways to the center of the development.

The image of the ideal small town environment can be given new form within the city by the conscious definition isolation of neighborhoods such as this one. If the individual is to flourish, he must again be able to perceive and relate himself to a finite environment of human scale and beauty.

Howard R. Meyer, F.A.I.A.

James Reece Pratt, A.I.A.

John Harold Box, A.I.A.

"The jury awarded the Grand Prize to an entry showing an unusual degree of sensitiveness, coupled with practicality. By unanimous consent, they found it to be a most convincing and beautiful solution at all levels, from the general concept to the varied and well-conceived details. It shows a respect for economy without forgetting the essential demands for aesthetic expression. In the opinion of the jury no other entry had the same degree of self-assurance or clarity of direction."

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Nine contractors competed and every one bid lower in concrete than in steel (actually 7 of the 9 bid concrete lower than anyone offered steel!)

The New York City Housing Authority reports a saving of $313,180 by using concrete frame and floor construction for the three 20-story buildings of the new Woodrow Wilson Housing Project. But such savings were not unexpected!

Concrete has been the Authority's preference for all of its buildings during the last twelve years.

For example, back in 1947 the NYCHA took bids for the Lillian Wald 16-building project. $880,000 in savings with concrete resulted. So a policy decision was made to stay with concrete for future projects.

In the intervening years, no fewer than 84 concrete frame projects were completed or in partial operation. They provided housing for 95,454 families. And thanks to concrete, we estimate the Housing Authority saved no less than $66,000,000!

More and more builders of all sizes are today demonstrating that when America builds for economy . . . it builds with concrete!

New York's Woodrow Wilson Houses. Architect: Pomerance & Breines, New York, N.Y. Structural Engineer: James Ruderman, New York, N.Y. Contractor: Leon D. DeMatteis Construction Company, Elmont, Long Island, N.Y.

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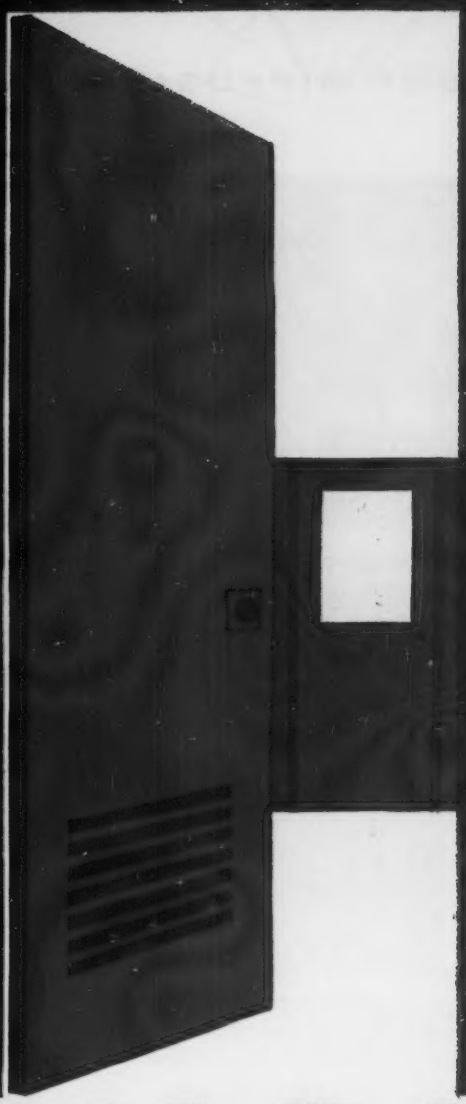

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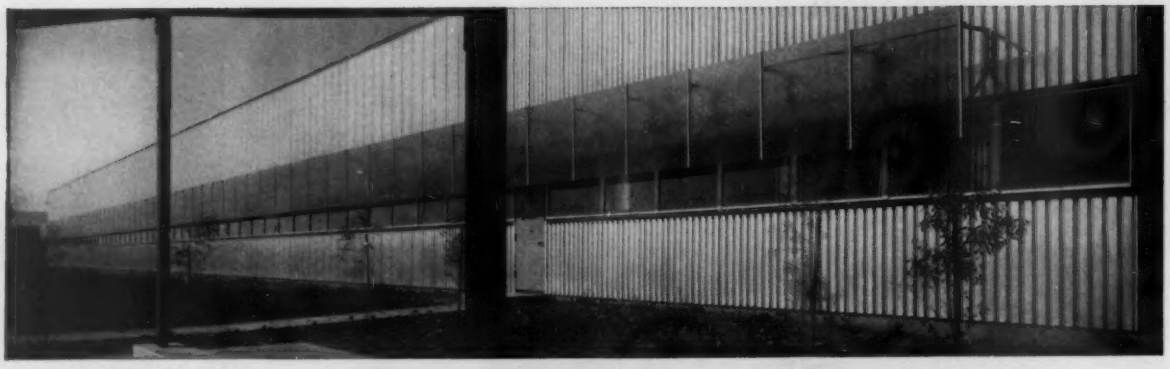
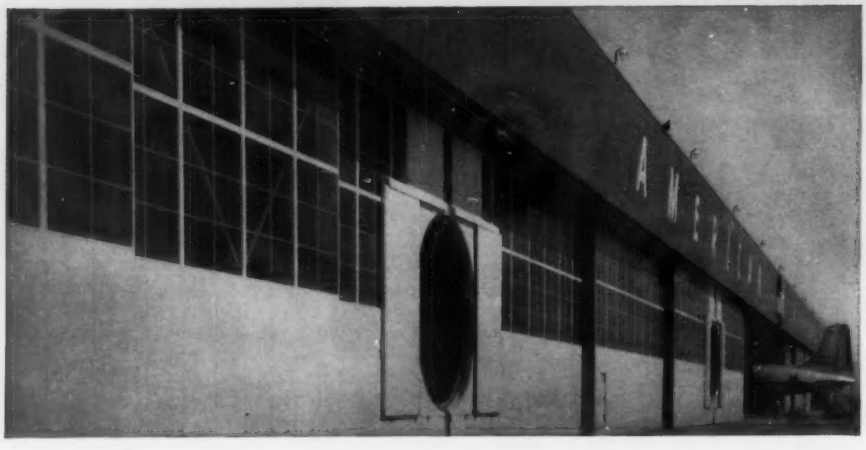


Architects: Marcel Breuer and Associates
Supervision: Craig Ellwood

A point of special architectural interest in the new Torrington Manufacturing Co. plant at Van Nuys, California is the sunshade of Coolite heat absorbing wire glass that spans the western elevation.

Complementing the spectacular new IBM offices in San Jose, California are these Hauserman partitions, glazed with lustrous Mississippi Broadlite glass.

Architect: John S. Bolles, San Francisco, Calif.
Partitions by: E. F. Hauserman Co., Cleveland, Ohio



1260 lights of ¼" Coolite Wire Glass provide better daylight with protection, while absorbing excess solar heat in expansive American Airlines Hangar at Los Angeles International Airport.

Architect: Quinton Engineers Ltd., Los Angeles, California
Glazing by: W. P. Fuller and Company, Los Angeles, California

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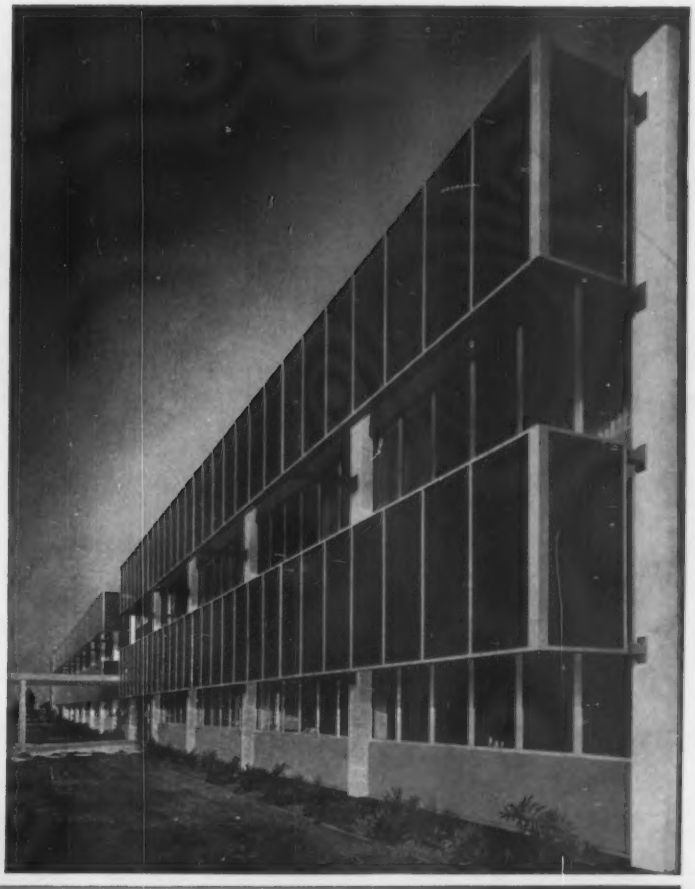
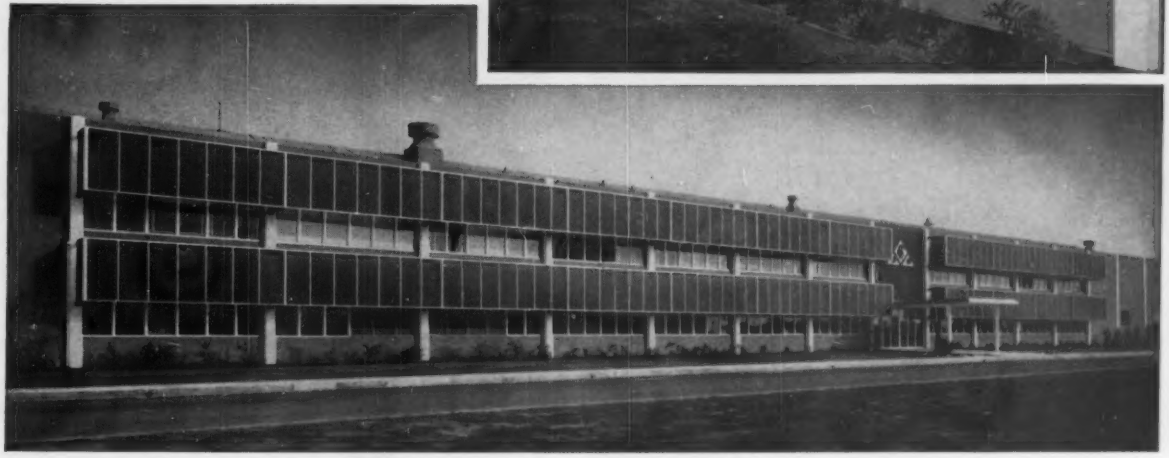


A place in the sun is especially desirable when heat absorbing blue-green Coolite Glass is there to help employees see better, feel better, work more comfortably. A brand new concept in "extended screen" glazing technique that combines beauty and utility.

Growers Container Corporation, Fullerton, Calif.
Architect: Falk and Booth, San Francisco, Calif.



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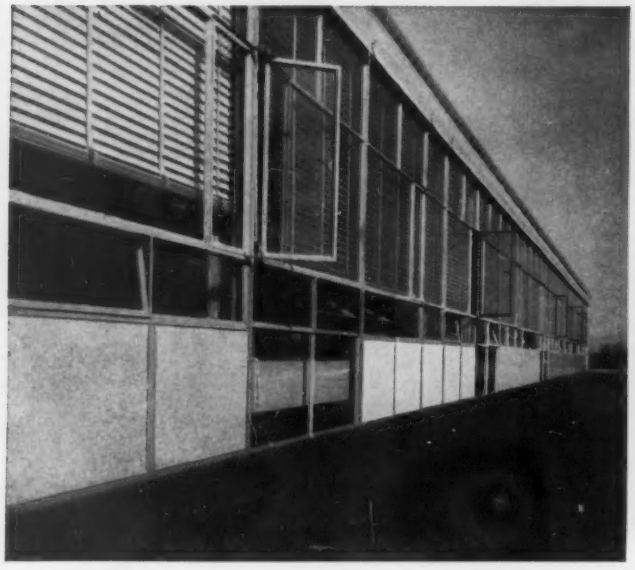
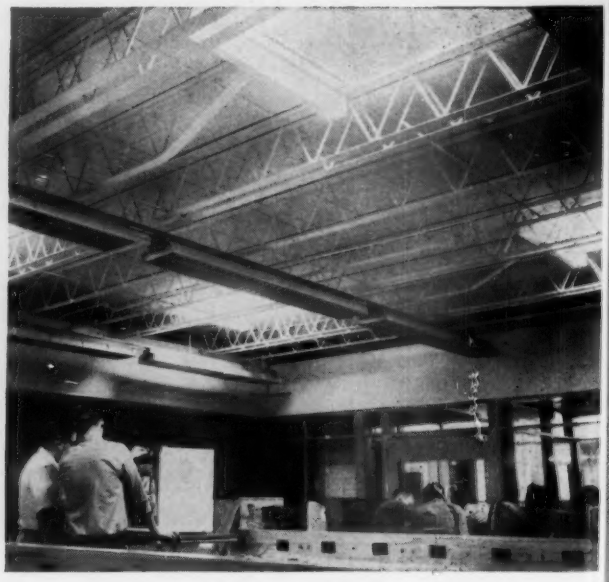
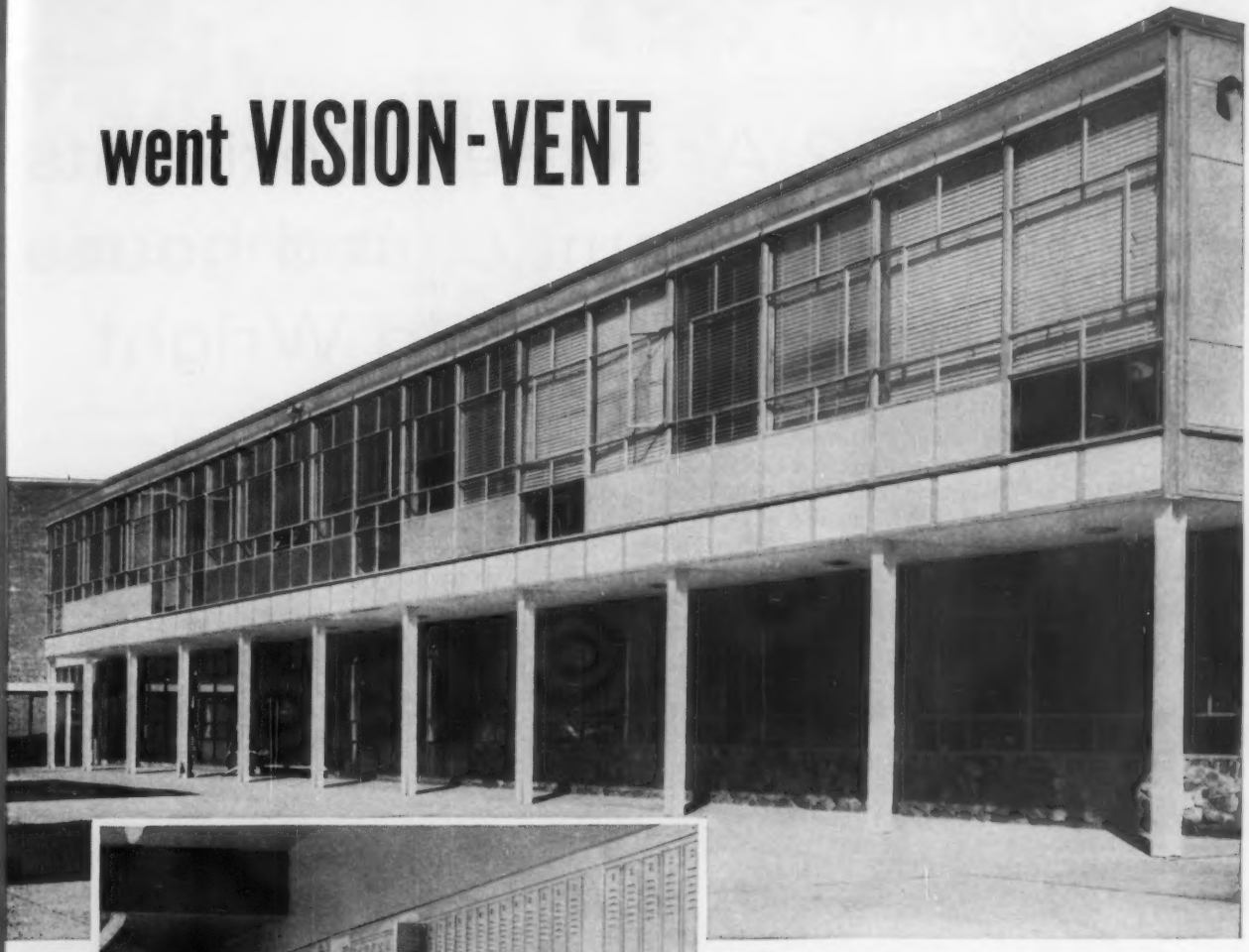


Cost of VISION-VENT Window Wall construction utilized by McLeod & Ferrara, Architects, compared favorably with any other type of construction considered. No other type, however, offered the combination of added light, beauty, durability, and complete flexibility of design.



Truscon "O-T" Open Truss Steel Joists® are employed exclusively in North Hagerstown's new high school. Joists are covered by acoustical ceilings in all but a few laboratories—such as the electronics lab seen above—where possible increases or changes in electrical systems will require complete accessibility. Send coupon for "O-T" Steel Joist details.

went VISION-VENT



Architects: McLeod & Ferrara, Washington, D.C.

These high-quality *Republic Steel Lockers* will be enjoyed by generations of North Hagerstown high school students. Designed and built by Republic's Berger Division to weather youthful exuberance. Bonderized to take and keep a finer enameled finish. New, improved handle. All locker sizes and styles. Complete planning, engineering, and installation service. Send coupon for complete information.

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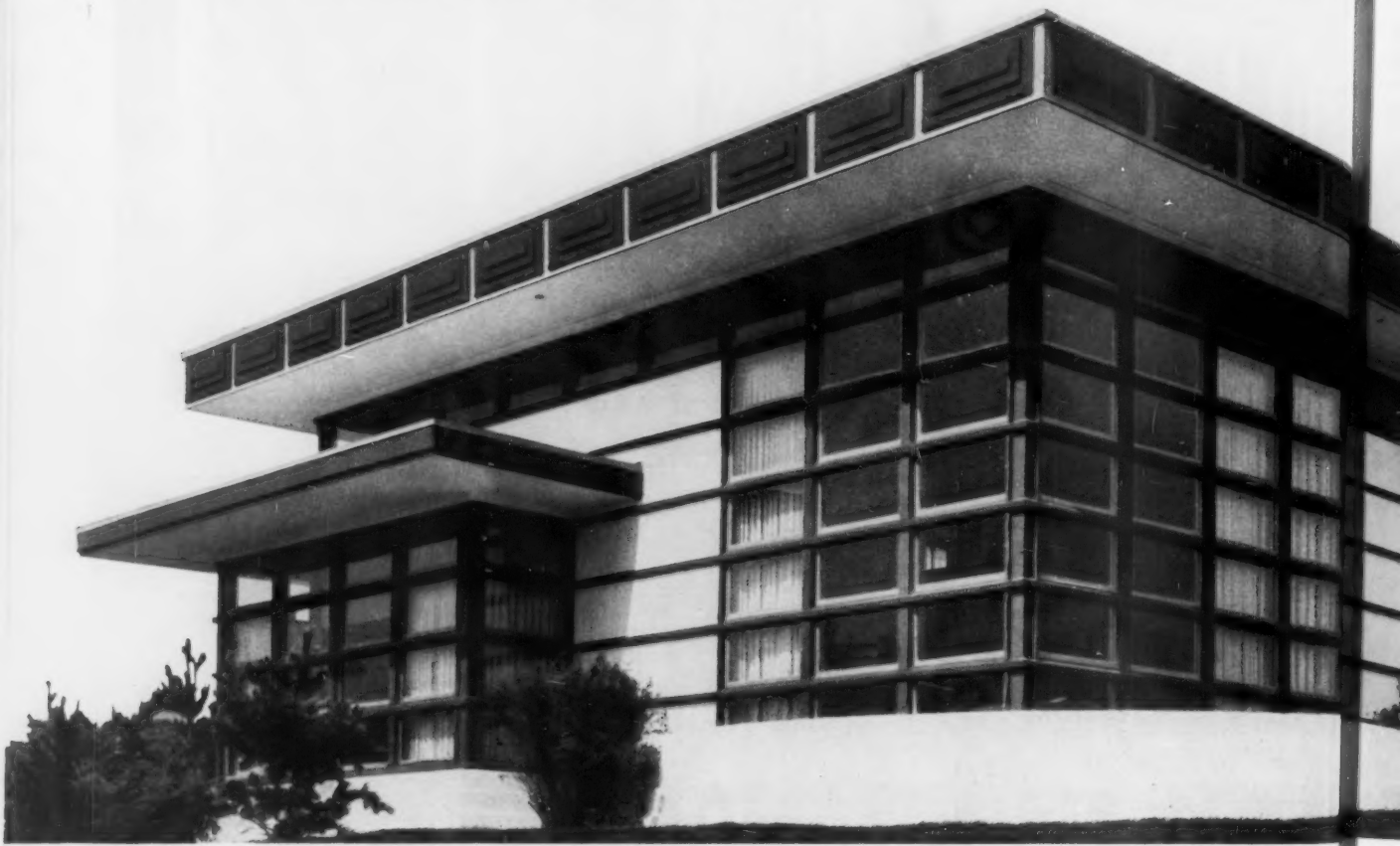
132 Andersen Flexivents® in this manufactured house by Frank Lloyd Wright

THIS SECOND of three houses designed by Frank Lloyd Wright for prefabricated construction is manufactured by Marshall Erdman and Associates, Inc., in Madison, Wis. The 2-story house, on a 2′ by 4′ module, makes liberal use of Andersen's versatile Flexivent Windows with fixed and operating sash.

Builder Erdman reports: "I get a lot of satisfaction, as a designer, engineer and manufacturer of quality homes, out of using a top quality window unit. Out of more than 500 homes with Flexivents, we've adjusted windows on only two complaints."

For all the facts on all *seven* of Andersen's complete window units, see your Sweet's File, or write Andersen direct.



Window Bay provides space added by Mr. Wright after original plans (on facing page) were drawn. Exterior color is cream ocher on pressed hardboard siding. Horizontal battens and ornamental facia stained redwood. Window trim Chinese red.

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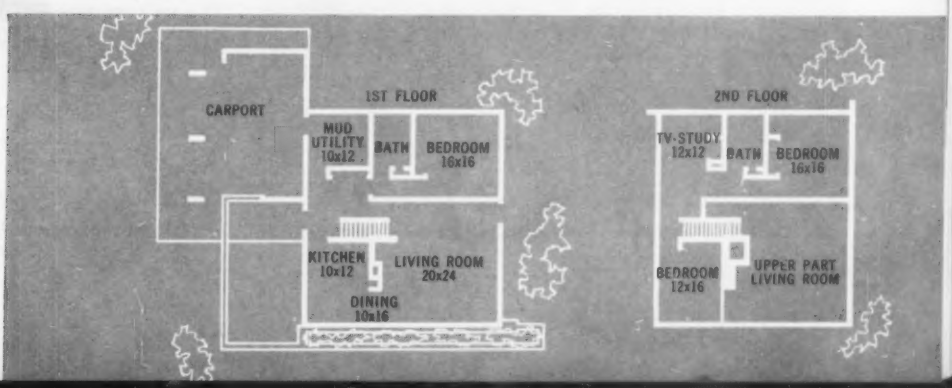
AW

(Above), **Corner WINDOWALLS** in 2-story living room give feeling of immense spaciousness. Operating sash of Flexivents are installed in awning position. Upstairs rooms form "gallery" overlooking living room.

FLOOR PLAN shows house is almost square. 2,912 sq. ft. of space. Walls of upstairs "gallery" are waist high; folding doors give privacy. $28,000 to $35,000 depending on inclusion of basement and built-ins.



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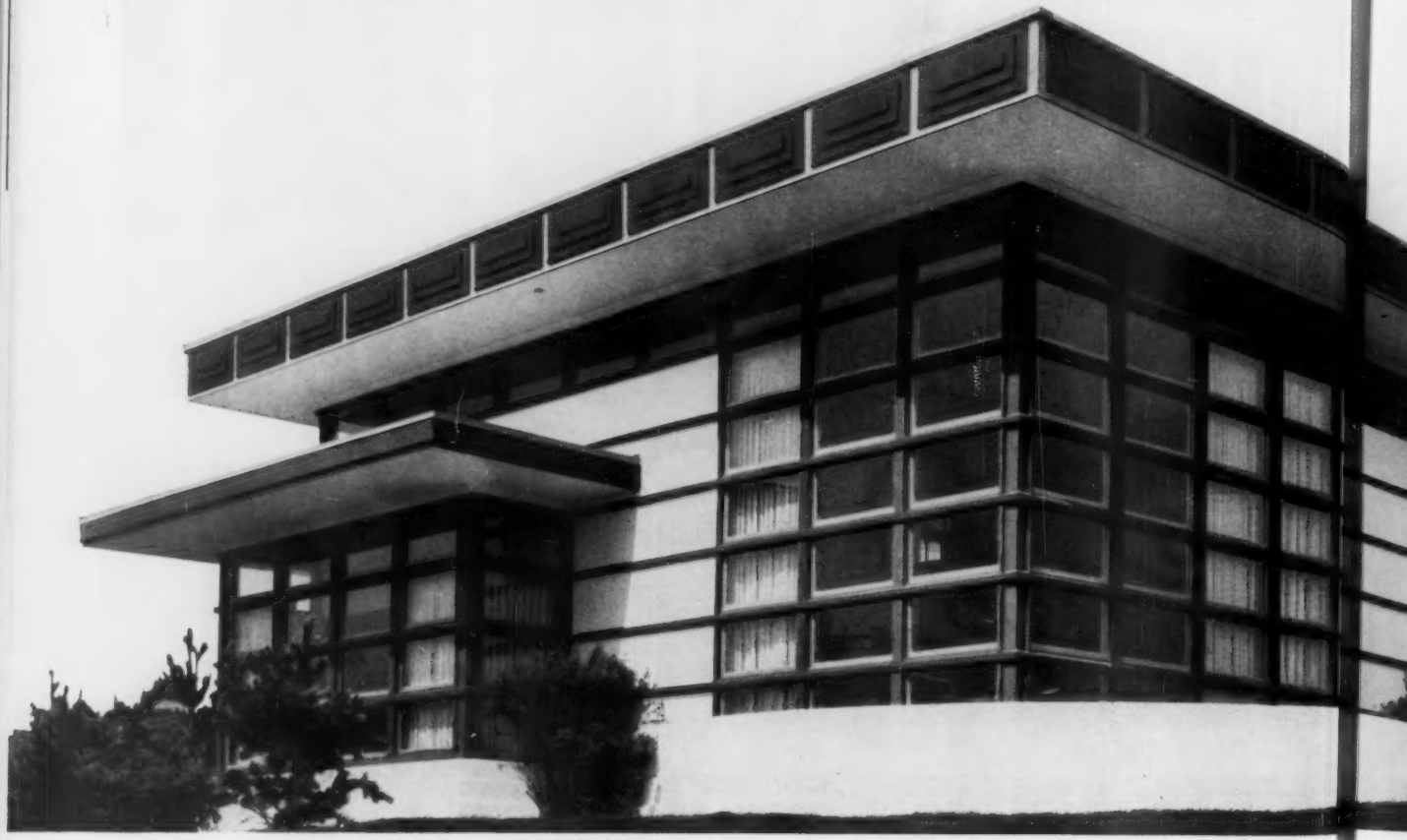

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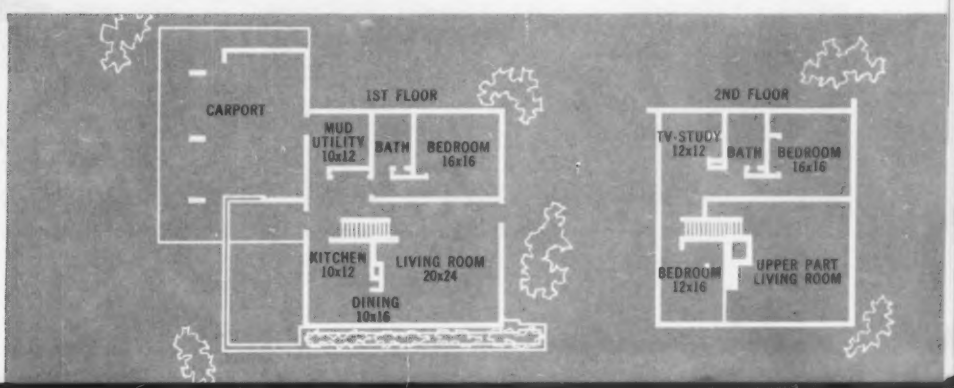

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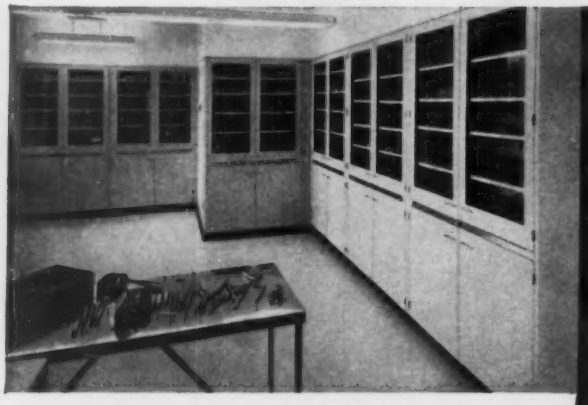
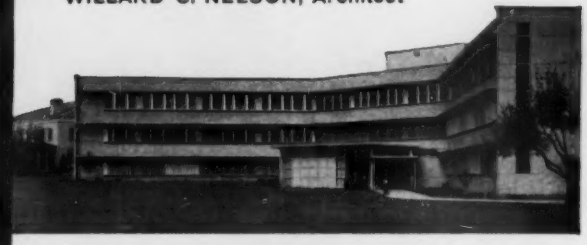


Instrument Storage

Chemistry Laboratory

JOHN H. ZENGER, Administrator
WILLARD C. NELSON, Architect



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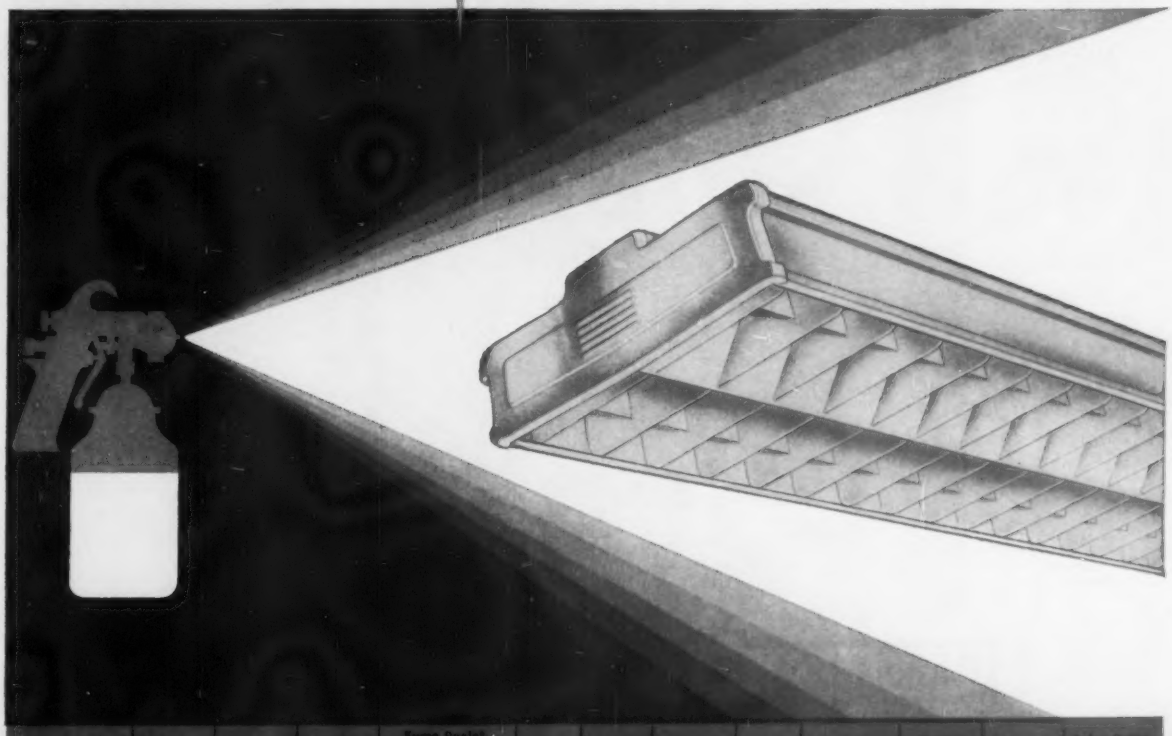

	Adhesion To Metal	Humidity Resist.	Salt Spray Resist.	Fume Resist.: Grease	Fume Resist.: Tobacco Smoke	Stain Resist.	Grease Resist.	Hardness	Mar Resist.	Reoperated Adhesion	Baking Color Stability	Heat Resist. (1)	Color Stable, Exposed to Ultraviolet
GOOD QUALITY FINISHES	8.0	8.5	8.5	7.5	6.5	5.0	7.0	8.0	8.5	8.5	7.5	5.0	5.0
NEW GUTH LUCITE* FINISH	9.5	10.0	9.5	8.5	9.0	9.0	10.0	22.0	9.5	10.0	8.5	9.0	9.0
PERCENT BETTER	18.75%	17.65%	11.76%	13.33%	38.46%	80.00%	42.86%	175.00%	11.76%	17.65%	13.33%	80.00%	50.00%

(1) 30 min. at 400° F. * ® DuPont

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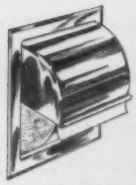

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Dufresne and Boulva—*Architects*
G. L. Guay & Frère, Ltée.—*Builders*

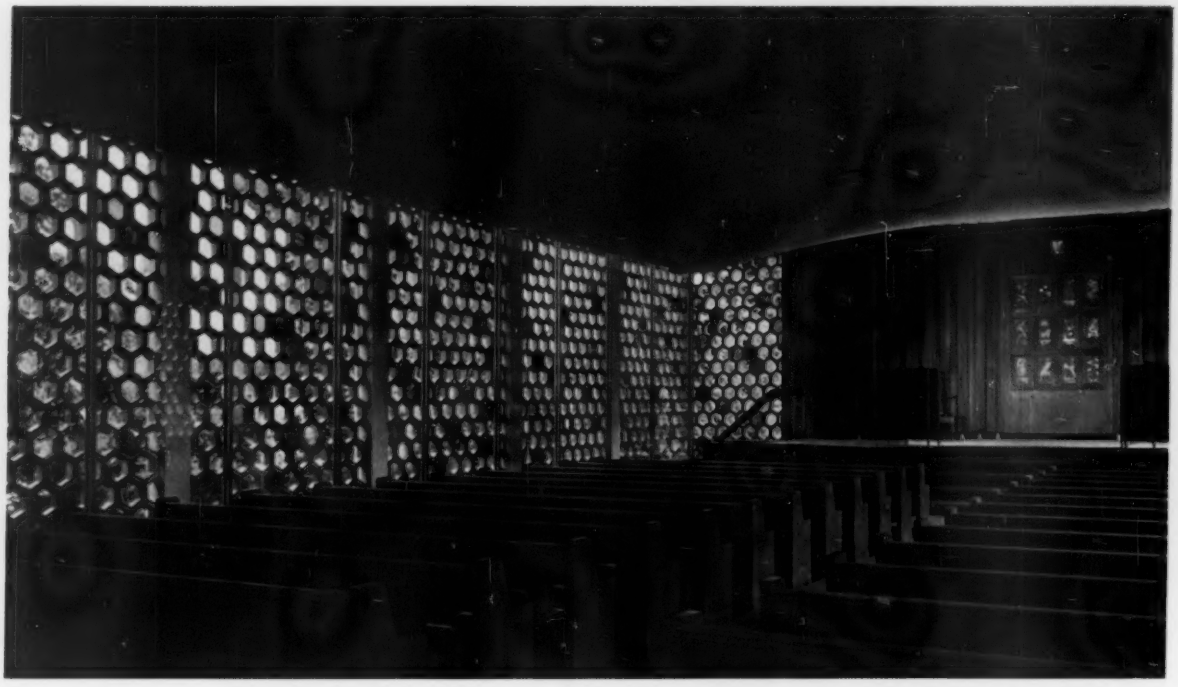
The official seal of St. Laurent was reproduced in polychrome Ceramic Veneer; tan Ceramic Veneer was specified for the facing. Unit sizes are 20"x 27" and 24"x 24".

CERAMIC VENEER
never limits creative expression

F S T C

FEDERAL SEABOARD TERRA COTTA CORPORATION

TEMPLE EMANUEL, Kingston, N. Y.—Arthur Silver, architect; Larsen-Johansen, Inc., builders: Sea Mist Green Ceramic Veneer was specified for these through-wall grille units; unit size is 11½" x 13" x 4".



CERAMIC VENEER BY FEDERAL SEABOARD

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In the creation of a specific architectural design, the use of color goes far toward establishing the proper atmosphere for the ultimate composition. Federal Seaboard ceramic veneer offers a choice of color unequalled by any other facing material. Permanence of color is assured by the impervious glazes of ceramic veneer.

Solid colors are available in a wide range of conservative or dominant hues.

Mottle colors are two or more colors blended in the application of the ceramic finish.

Polychrome consists of two or more colors applied separately to a specified area. Hues available in polychrome are practically unlimited, including "two-fire" glazes such as gold, silver, orange and vermilion at additional cost. (See section 2(d) of specifications.)

FINISH

Gloss finish provides a reflective surface suitable where lustrous glaze is desirable.

Satin finish provides a surface of medium reflectivity.

Vitreous slip or unglazed finish provides a surface of low reflectivity suitable for exteriors, particularly for use in combination with other masonry materials.

TEXTURE AND FORM

Texture is the appearance produced by the surface of ceramic veneer apart from its color and finish. The surface texture range is wide and varied—smooth, fine and coarse roughened, or tooled. Beveled, fluted or scored forms as well as custom-designed surface treatments are available.

ECONOMY

Maintenance. Ceramic veneer guarantees the absolute minimum of expenditures for maintenance during the entire life of the structure. The hard, impermeable glazes act as an enduring seal against grime, smoke, acids and other impurities, assuring the removal of any surface film by a simple soap and water washing.

Permanence. Ceramic veneer, either adhesion or anchored type, becomes an integral part of the structure. Its impervious finish will permanently resist weathering and will always retain its original colors.

PATTERN

The architectural possibilities of ceramic veneer—color, form and texture—are infinite, bounded only by the imagination. Made from molds, ceramic veneer offers the most inexpensive execution for repetitive designs.

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Decorative architectural terra cotta offers the designer a wide choice in the execution of architectural treatments. Delicate sculpture or simple bas-reliefs in either monochrome or polychrome, are produced precisely to your specifications by Federal Seaboard craftsmen.

GRILLES

Federal Seaboard offers a number of smart grille designs in the full color range of ceramic veneer. If required, grilles can be custom-made to your own design. Whatever the purpose—for sun control, to reduce air conditioning requirements or to create new beauty for structurally sound older buildings, investigate the many advantages of versatile ceramic veneer grilles.

111 WEST 40th STREET BUILDING, New York, N. Y.—Kahn & Jacobs and Sidney Goldstone, architects; George A. Fuller Co., general contractor: Ceramic Veneer was used for vertical pier facing and coping of this 35-story office building.

PUBLIC SCHOOL NO. 93, New York, N.Y.—Board of Education, architect; Caristo Construction Corp., builders: facing for vestibule of entrance, lobby and entrance hall is green Ceramic Veneer in units 18″ x 18″.

OUR LADY OF ASSUMPTION CHURCH, Wood-Ridge, N. J.—Anthony De Pace, architect; Romagnino Construction Company, builders: mottled pink and gray facing units, 22″ x 24″, gray textured grille units, 15″ x 15″, and the 19-ft. polychrome terra cotta statue were supplied by Federal Seaboard.

ADHESION TYPE CERAMIC VENEER

The maximum overall thickness of the adhesion type ceramic veneer slab is not over 1¼″.

The maximum face areas of individual slabs do not exceed 540 square inches. The maximum overall face dimension is 20″x27″. Any intermediate size is available.

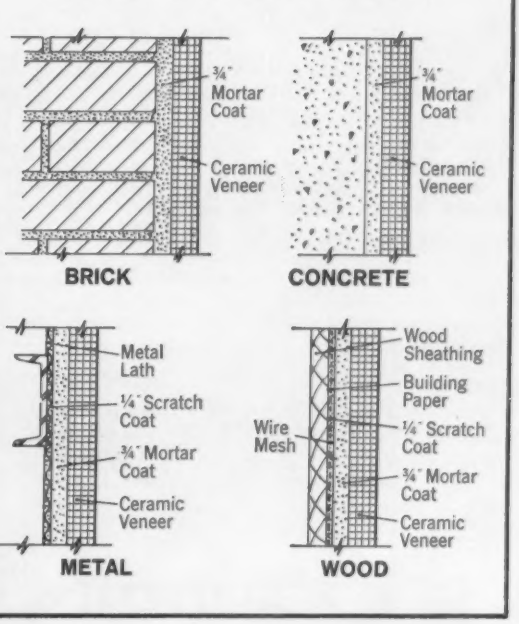
This type of ceramic veneer requires no metal anchorage, but is held in place by the adhesion of the mortar to the ceramic veneer body and the backing wall. The overall thickness from the face of the ceramic veneer to the face of the backing wall will be only 1¾″ to 2″. Round metal ties, ⅛″ in diameter, may be used if required.

Extensive shear tests on adhesion type ceramic veneer wall panels indicate that the shearing strengths developed are far in excess of those required by building codes. Such codes require that a unit shearing strength of not less than 50 psi be developed between the backing and facing. Tests indicate that average shearing strengths of 138 to 174 psi are actually developed between the facing and the backing by adhesion.

ANCHORED TYPE CERAMIC VENEER

Anchored type ceramic veneer is recommended where the architect desires a larger scale slab. Such slabs are available in any intermediate size up to 26″x36″. Scoring is provided on the backs of such units and the overall slab thickness will be a nominal 2″. A minimum of 2½″ is required from rough wall to finished veneer surface to provide adequate grout space between the veneer and the backing. Anchor holes are provided in the bed edges of the slabs for the installation of anchors. The ribs on the back of the panel are keyed into the grout.

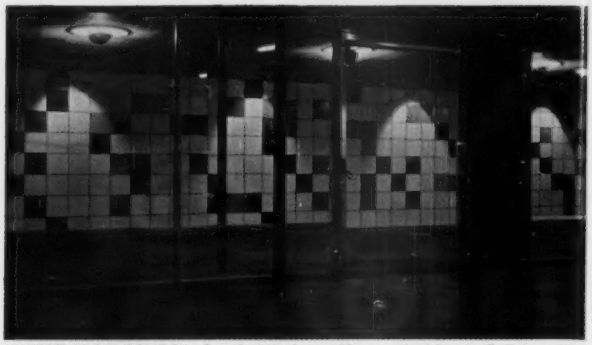
HOW CERAMIC VENEER IS APPLIED TO VARIOUS BACKINGS



STANDARD SPECIFICATIONS

for furnishing and erecting

CERAMIC VENEER



JUNIOR HIGH SCHOOL, South Attleboro, Mass.—Architects Collaborative, architects; Vara Construction Inc., builders: this colorful wall is made of Ceramic Veneer in units 12″ x 12″ x 1¼″.

1. SETTING DRAWINGS

The terra cotta manufacturer shall provide two copies of scale shop drawings developed from the architect's drawings and approved by the architect. These shop drawings are to be used for setting and shall indicate all dimensions and sizes of joints, as well as all anchors, hangers, expansion and pressure-relieving joints, etc., which are furnished by others.

2. CERAMIC VENEER UNITS

(a) *quality* Ceramic veneer shall conform to the requirements of the Specifications for Architectural Terra Cotta and Ceramic Veneer of the Architectural Terra Cotta Institute for quality of finish and physical properties of the units.

(b) *dimensions* Adhesion type thin ceramic veneer which is attached to the backing by the bond between mortar and masonry without the use of metal ties shall be not over 1¼″ thick.

Anchored type ceramic veneer, attached to the backing by non-ferrous metal anchors shall be nominally 2″.

All ashlar shall be sized by grinding or cutting and face lengths and widths shall not vary more than 1/16″ over or under the dimensions called for on the setting drawings.

(c) *surface* The exposed face of all ashlar shall not vary from a true plane by more than the amount shown in Table 1.

TABLE 1

Face Area sq. ft.	Maximum Permissible Distortion in Inches
1 and under	1/16
Over 1 to 2	1/8
Over 2	3/16

(d) *texture and color* The texture, ceramic finish and color of all exposed surfaces of terra cotta shall be as approved by the architect and are subject to normal ceramic variations. If polychrome or two-fired colors, such as gold, silver, orange and vermilion, are required, the extent of their use shall be indicated on the architect's drawings or in the specifications.

> *Note: Glazes which mature at lower temperatures than the clay body must be applied to the burned body. This double firing, as well as the high cost of the raw materials required for many low-fired glazes, results in a substantial increase in the cost of these colors as compared to single-fired glazes.*

(e) *delivery* Terra cotta shall be shipped to point of delivery stated in the contract, properly packed, and in sound condition. The setting contractor shall receive all terra cotta at street curb and be responsible thereafter for its good condition. Terra cotta shall be stored under cover not in contact with the ground and shall be stacked on wood lath or strips so as to protect it from injury.

3. MORTAR

Mortar shall be proportioned by volume for the type specified within the following limits for both anchored and adhesion types:

Setting and Pointing Mortar: 1 part portland cement, ½ part high calcium lime putty and 4 parts sand to which is added ammonium stearate or approved equal.

Mortar Grout: Setting mortar to which sufficient additional water is added to cause the mixture to flow readily.

Pea Gravel Grout: 1 part portland cement, 1 part sand and 5 parts graded pea gravel passing a ⅜″ sieve.

4. ERECTION

(a) *supports and anchors* Expansion and pressure-relieving joints shall be erected and non-ferrous metal anchors shall be installed where shown on approved terra cotta setting drawings. Metal supporting or securing the terra cotta shall be thoroughly embedded in the masonry and shall be protected from corrosion by incasing in mortar or grout. In the case of concrete construction, loop dowel anchors or other anchors approved by the architect shall be used, together with horizontal grooves 6″ wide cast in the concrete.

(b) *wetting* At the beginning of setting each day, all walls to be faced shall be drenched with clean water and shall be drenched again with water approximately 1 hour before setting of ceramic veneer. All terra cotta and ceramic veneer shall be wetted in accordance with manufacturer's recommendations with clean water just prior to installation and shall be noticeably damp at the time of laying.

(c) *setting*

(1) anchored type ceramic veneer: Terra cotta shall be set true to line in setting mortar and shall be anchored in accordance with approved setting drawings. All spaces between anchored type terra cotta and backing wall 2″ or more in width shall be filled solidly with pea gravel grout. Spaces less than 2″ in width shall be filled solidly with mortar grout. Voids in open back hand-molded terra cotta shall be filled with brick masonry as indicated on manufacturer's drawings.

(2) adhesion type ceramic veneer: Just prior to application of mortar, a limited area of the wall and entire back of the piece of ceramic veneer about to be set shall be given a brush coat of neat portland cement and water. Brush coats shall be of such consistency that they will spread evenly. Immediately thereafter, spread one-half of the mortar coat on a limited area of the wall and the other half on the entire back of the piece of ceramic veneer and tap it in place on the wall so as to completely fill all voids. The total thickness of the mortar coat shall average ¾″, but sufficient mortar shall be used to create a slight excess which will be forced out at the joints and the edge of the piece when it is tapped into place.

When applied to soffits, each piece of ceramic veneer, in addition to the usual centers and wooden wedges, shall be supported by suitable bent vertical wooden shores exerting a constant upward pressure until the mortar coat has set for several days.

(d) *tooling and pointing* When pointing is specified, all mortar joints shall be raked to a depth of ½″. Before pointing, joints shall be saturated with clean water, after which they shall be filled solidly with pointing mortar and tooled. If pointing is not specified, all mortar joints shall be tooled as the setting progresses to form a concave joint. All surplus mortar and stains shall be removed as the setting progresses and the surface shall be left clean.

(e) *cleaning* Upon completion of the setting, all surfaces shall be cleaned with soap or washing powder and rinsed thoroughly with clean water. Abrasives or metal tools shall not be used.

F S T C

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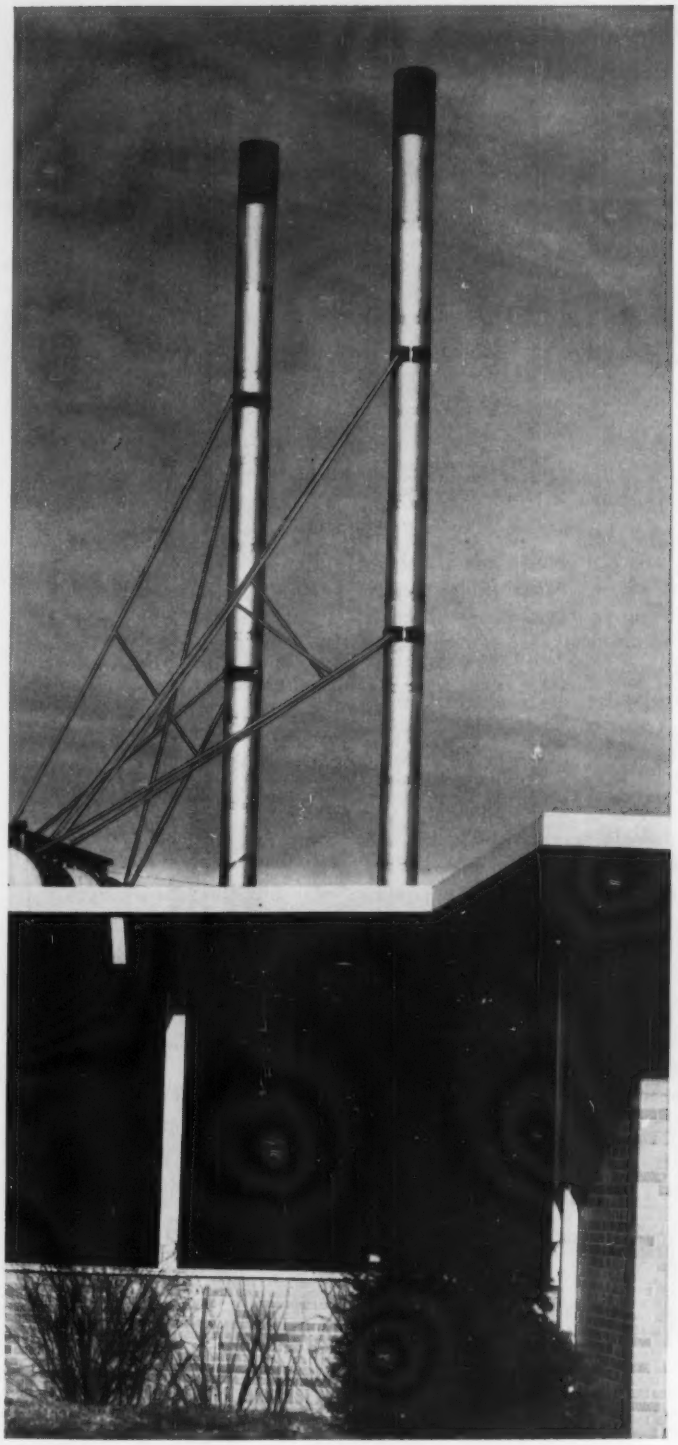

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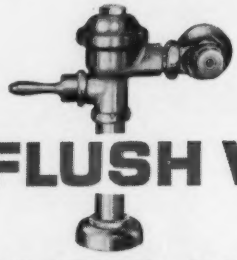

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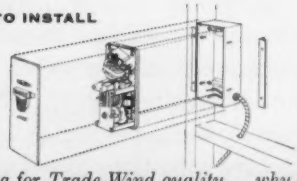

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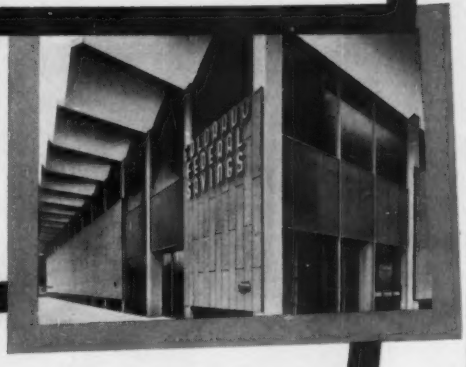

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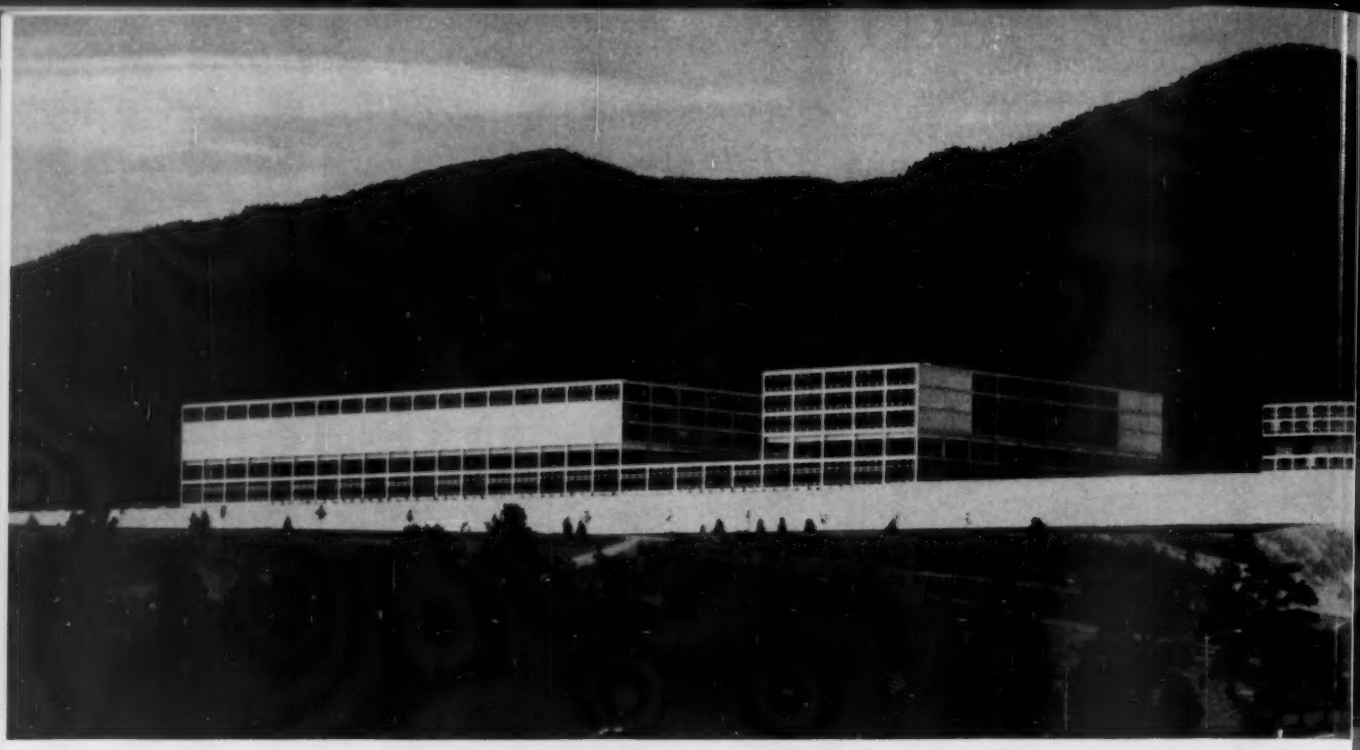
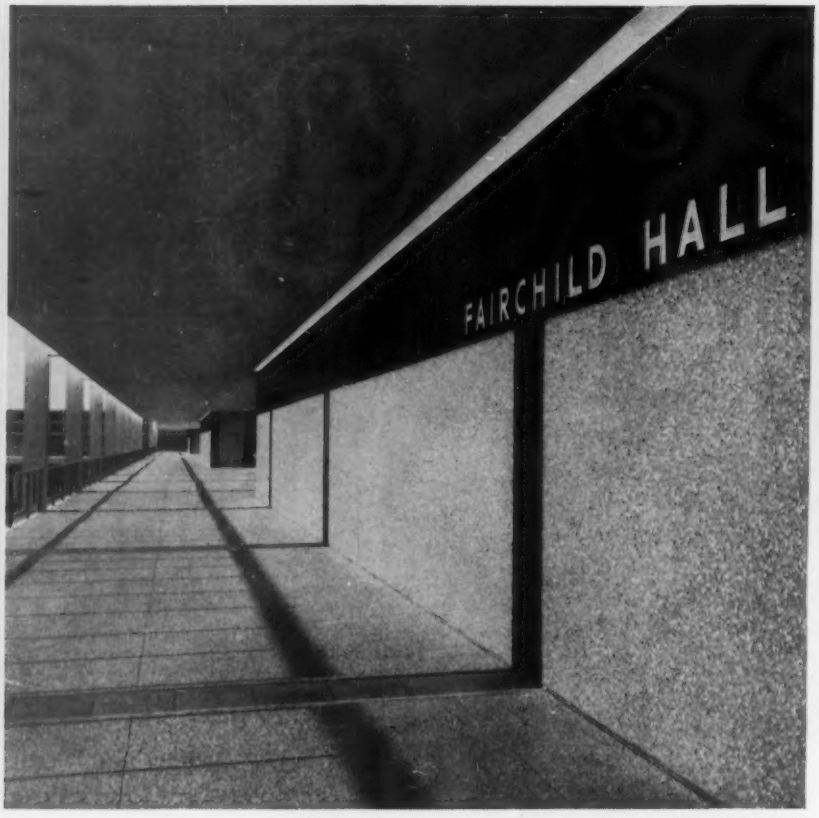


United States Air Force Academy, Colorado Springs . . . dramatically positioned with the Rampart Range of the Rocky Mountains as a backdrop.

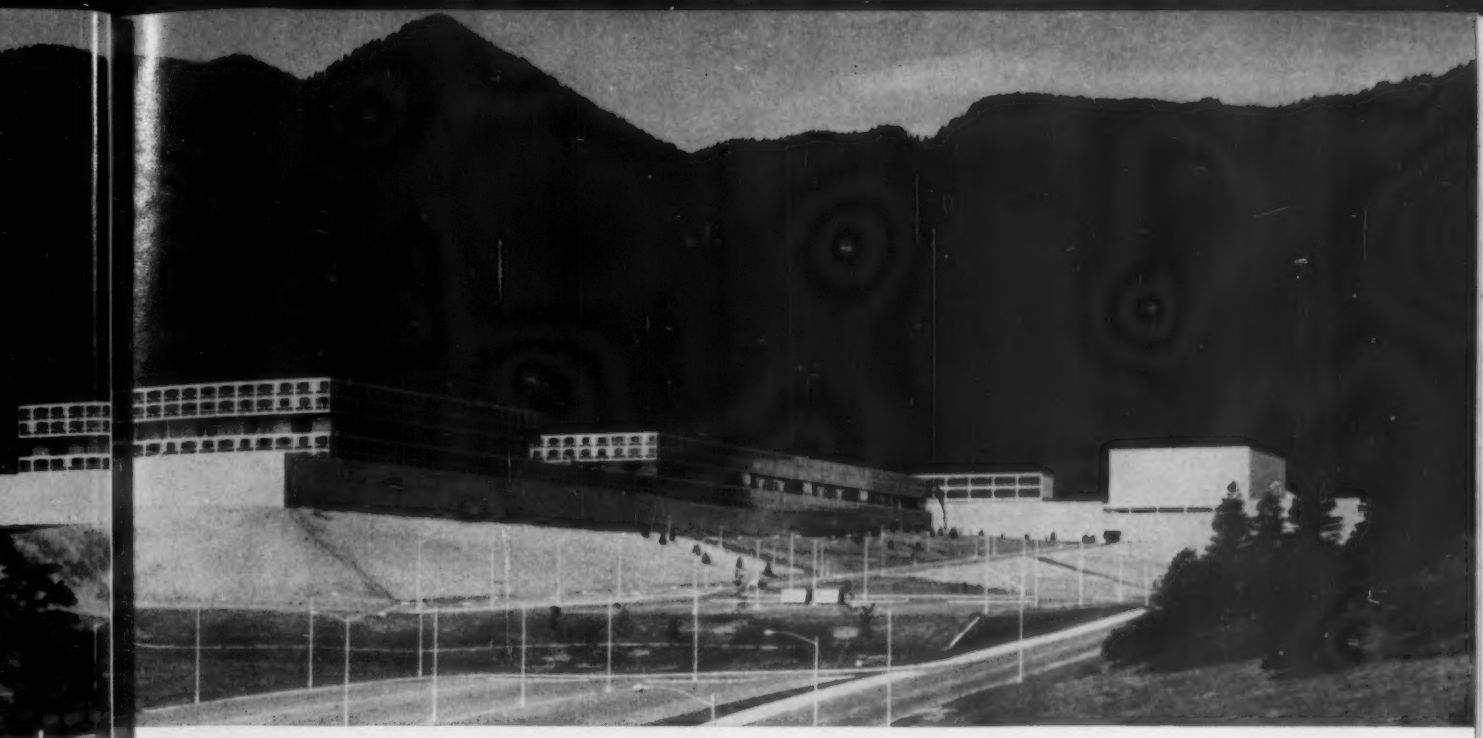
Architects & Engineers: Skidmore, Owings & Merrill.

Electrical Engineer: Syska & Hennessy, Inc.



Fairchild Hall where open floors give a semblance of flight. The outside corridors are illuminated by special corner fixture troffers using lenses to direct light outward.

Cafeteria in the headquarters building in the service and supply area. Here flush mounted troffers with curved lenses assured a pleasing lighting effect of low brightness luminescence.



A monument to tomorrow...

The Air Force Academy

Complemented by AllBrite Lighting in Keeping with the Space Age

A calvacade of contrast . . . that's the Air Force Academy near Colorado Springs.

Buildings of aluminum, glass and white marble in military order seem to march down a mesa of broad terraces. There are buildings within buildings, separated by courts. All in all, there is earthbound strength in their precise arrangement. Yet, a sense of air and flight permeates structures that stand on stilts. Here and there floors are left completely open. Colored walls of glass mosaic read as vertical planes to add illusion of height.

This feeling of the future challenged imagination in illumination so unusual effects were sought. In one instance open floor areas were illuminated by special AllBrite corner troffers using lenses which gave light an outward direction, adding to the semblance of flight. In another, an office area was bathed in low brightness luminescence to create an unusually restful atmosphere. This was achieved by AllBrite troffers with curved lenses.

Thus did architects Skidmore, Owings & Merrill wed lighting to the total design concept of a monument to tomorrow . . . and with special skills and products AllBrite engineering served the architects well. Curtis-AllBrite Lighting, Inc., AllBrite Lighting Division, 352 Shaw Road, South San Francisco, California; Curtis Lighting Division, 6135 West 65th Street, Chicago 38, Illinois.

East end of the headquarters building in the service and supply area. Lighting was achieved by troffers with curved lenses which assured an unusually restful atmosphere.

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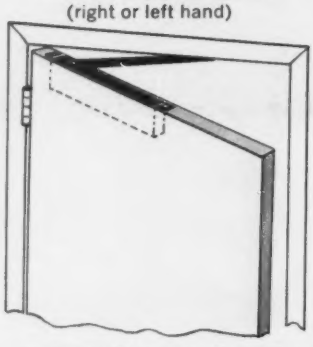

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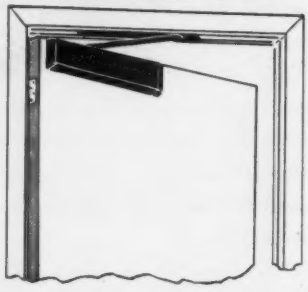

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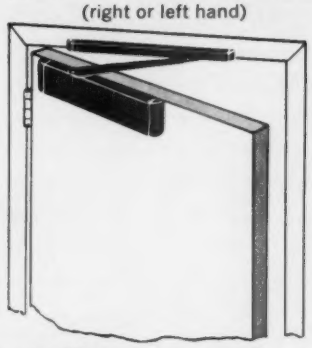

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The Chase Manhattan Bank Building

A BETHLEHEM STEEL REPORT ON ONE OF THE SIGNIFICANT STRUCTURES OF OUR TIME

BETHLEHEM STEEL

Architect: Skidmore, Owings & Merrill; consulting foundation engineers: Moran, Proctor, Mueser & Rutledge; consulting structural engineers: Weiskopf & Pickworth; consulting mechanical engineers: Jaros, Baum & Bolles; consulting electrical enginers: Meyer, Strong & Jones; general contractor: Turner Construction Company.

"Like a shaft of light..."

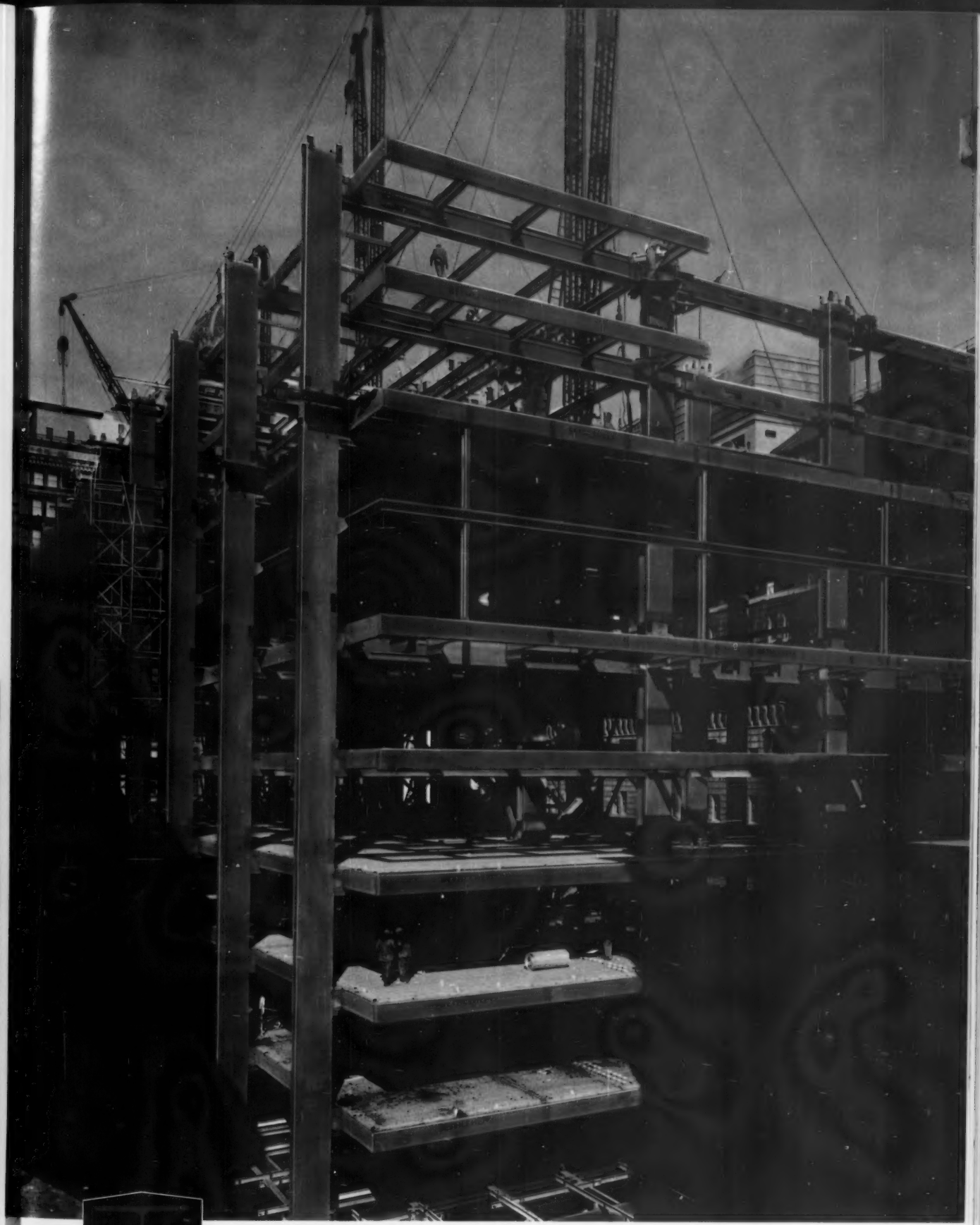
This apt phrase was used by an architectural journal in describing the design of the new headquarters of The Chase Manhattan Bank. Its lofty tower of glass and metal will glow amidst the somber facades of lower Manhattan. And, occupying only about a third of the 2½-acre site, it brings sunlight and air and spaciousness to the dark canyons of Wall Street.

Fifteen thousand employees will occupy the building, which rises sixty stories into the air, and extends five floors below ground level. Gross floor area is more than 2.3 million sq ft. The tower rises 810 ft without setbacks, and is approximately 281 by 107 ft in plan. It required approximately 53,000 tons of structural steel, fabricated and erected by Bethlehem. Nearly 5,000 tons of this total, plus some 1,100 tons of sheet piling, were required for the substructures alone.

BETHLEHEM STEEL

The column sections, up to 36 ft long and up to 52 tons in weight, were fabricated at Bethlehem's Pottstown Works. Made from heavy plate material, the sections' outside dimensions are uniform up the entire 810-ft height of the structure.

This project marked the first time that permanent floor steel was used as a horizontal strut system, or crosslot bracing, replacing the usual temporary bracing of cofferdams. The steel was erected downward from grade. As each level was placed and jacked to brace the outer walls, the contractors (The Foundation Co., George M. Brewster & Son., Inc., and Joseph Miele Construction Co., Inc.) excavated to just below another level, allowing more steel to be erected. This process was followed for five subsurface levels, to a depth of 80 ft.



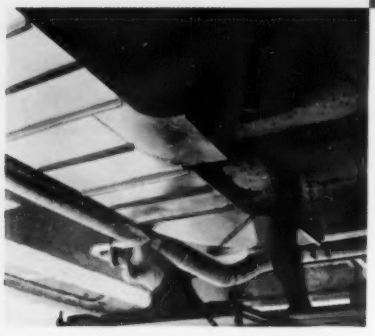
BETHLEHEM STEEL

In addition to fabricated structural steel, Bethlehem products used in the Chase Manhattan Building include high-strength structural bolts, sheet piling, concrete reinforcing bars, and electric resistance-weld pipe. Bethlehem wire rope and strand were used for rigging the guy derricks. In addition, manufacturers used Bethlehem products in fabricating the steel flooring, wall partitions, ductwork, and miscellaneous ironwork.

Steel decking, made by a Bethlehem sheet customer, was used throughout the building. It was laid quickly and economically; no need for forms. Electrical raceways provide flexibility for the huge open floor areas. Movable steel wall partitions have been designed by the architects and fabricated for use in this building.

An ironworker tightens Bethlehem high-strength structural bolts, used for all field connections. Bolting is faster, quieter, and safer than riveting and makes tighter joints.

Some 1,500 tons of Bethlehem electric resistance-weld steel pipe up to 16 in. diameter was used for the water lines of the heating and air-conditioning system.



The 9,000-ton-capacity air-conditioning system is believed to be the largest ever installed in a commercial office building. The ductwork shown here was made from Bethcon, continuously galvanized steel sheets.

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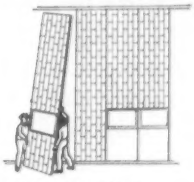

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Shepard solves the problem

The solution, while not easily arrived at, was basically simple. By changing the number of gear teeth the engineers were able to compensate for cutting tool faults and produce a perfectly uniform gear.

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response to *"The New Sensualism"* . . . "new?" . . . "timely" "fair" . . . "less talk". . . "comprehensive" . . . "trends askew?"

Dear Editor: I have read your most refreshing article on "The New Sensualism," and I brought it immediately to the University (School of Architecture) where they are translating it into Spanish. I think it is a *very important* article which should be known by our Mexican students. If—as I hope—there will be some reactions "pro" or "con" to the article, from the talk of these young architects, I'll write it to you immediately. It would be a wonderful thing, I think, to make a whole *book* on "The New Sensualism." In my opinion, the article (and the whole topic) is most important.

MATHIAS GOERITZ
San Angel, Mexico

•

Dear Editor: I don't know if I quite agree with the title and classification of the different trends, but the subject is timely and interesting. Perhaps, you should have emphasized the relationship of buildings to one another in our cities. These require many different types of buildings that can, I believe, happily live together.

JOSE LUIS SERT
Cambridge, Mass.

•

Dear Editor: Many thanks for your article, "New Sensualism." Sensuality may be the end result, but, as you point out, it can never be the motivating force. It occurs to me that the *mechanical systems* (which costs so much) have inherent within them very real possibilities, and contribute much to "The New Sensuality."

You will find enclosed a couple of photos and a reprint of an article describing the key to the Blue Cross-Blue Shield Office Building now under way in Boston. In this case, the relative plasticity of the building comes from the *combined* structure and mechanical system. The heating and cooling (for the typical office floors) is on the roof and the ducts are like a great octopus surrounding the entire exterior. It can be noted that the returns stop before they touch the ground, indicating their nonstructural aspects. The heating and cooling ducts are approximately one-half the size of the return. The remaining half is the structure. The ducts stop at the top of the Y-shaped columns. The spandrels are thickened between the hot and cold ducts to accommodate the attenuation chambers.

All of the vertical members are the same size, because structure plus a feed-

misplaced reference

P/A's capsule analyses of "Eleven Wall-Assembly Details" featured in the SEPTEMBER issue contained one unfortunate type transposition that we hereby call to the attention of our Readers—particularly those who file such reference data—as a last-minute error for which we apologize to everyone affected by it. During final stages of preparation of that Special Study, the concluding four lines written for Page 189 ("The proprietary curtain-wall system was fabricated by Kimble Glass Company, which assumed full responsibility for proper performance of the wall assembly.") were somehow separated from the analysis of the "Thin, Glass-Block" wall on that page, designed by Skidmore, Owings & Merrill. This error was compounded when the four lines were placed at the beginning of the description of "Glass-Block Masonry" on Page 190—confusing an analysis that was already complete. This referred to Kane Memorial Hospital, Pittsburgh, designed by Button & McLean and Mitchell & Ritchie, Associated Architects, where the selected wall of Pittsburgh Corning "Suntrol" glass blocks alternating with plate-glass panels in an aluminum grid was erected, with Albro Metal Products Corporation assuming responsibility for proper functioning of the wall assembly.

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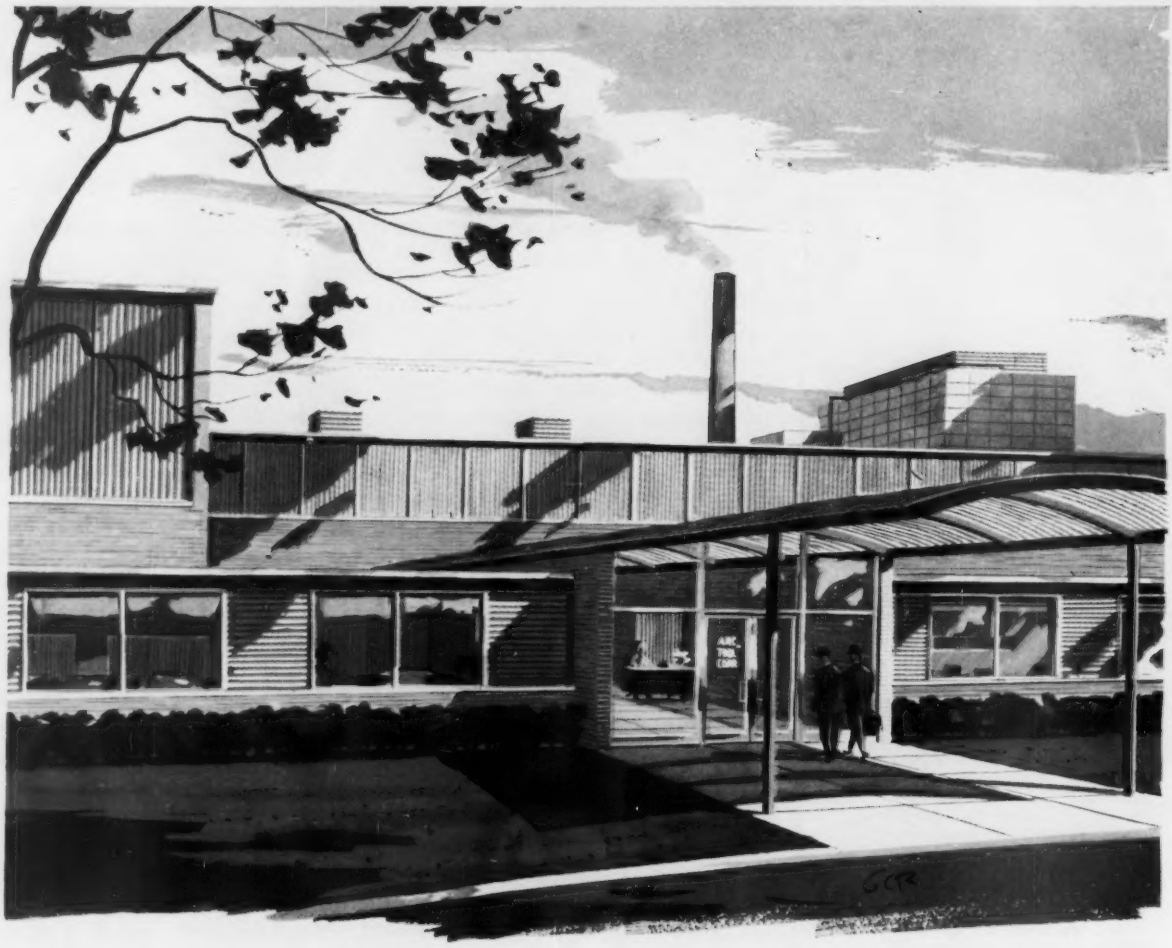

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"The New Sensualism"

ing duct equals the size of a return duct. More importantly, the *middle* (of the *beginning, middle* and *end*) should read as a texture and not be overly articulated. The end result is not "mechanical exhibitionism," I hope, but a unified formal whole. The mechanical system, as such, cannot be read unless one *knows*.

You will also find enclosed a couple of shots of our second High School for Sarasota, Florida. The mechanical system again plays an important role in the arrangement of solids and voids. In this case, two beams are placed six feet apart. A *bottom* and *top* connects the beams, thereby forming a chase for the mechanical systems. The resultant offsetting of the vertical and horizontal planes becomes the theme of the building.

As you see, I am fascinated by this "monster," the mechanical system. We need more from it than just keeping us comfortable. It has seeds which may grow until they become the integrated sculpture for us. Corbu, of course, started this, with his great vent stacks.

You will also find enclosed some photographs of the Greeley Laboratory for Yale. The Y-shaped columns are of precast concrete, and the ceiling coffers; the whole being tied together with an undulating poured-in-place beam. The possibilities inherent in precasting of concrete will, in the next decade, augment the curtain wall.

PAUL RUDOLPH
Department of Architecture, Yale University
New Haven, Conn.

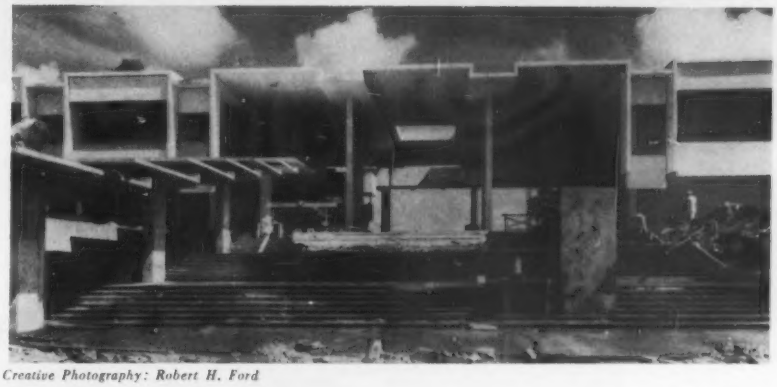
•

Dear Editor: Your two-part article is a wonderfully thoughtful analysis of the state of architecture. Your probing into

(Continued on page 61)

Arber-French & Co.

Recent work referred to by Paul Rudolph in the accompanying letter includes Massachusetts Blue Cross-Blue Shield Building in Boston (above) *by Anderson, Beckwith & Haible and Rudolph.*



Creative Photography: Robert H. Ford

Ronald C. Binks

The new High School for Sarasota, Florida (above), *and Greeley Memorial Laboratory, School of Forestry, Yale University* (left), *also are Rudolph works recently completed.*

Pittsburgh Fab-Form, available in lengths up to 28 feet, 3 inches with ⅝-inch corrugation, is handled easily on steel joists by one man at St. Regis Church and School in Trafford, Pa. Contractor H. Justin Brown & Son, Mt. Lebanon, Pa., reported it took four men just one day to lay 10,800 square feet of Fab-Form. Fab-Form was sold and engineered by W. N. Dambach, Inc., Pittsburgh, Pa.

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Fab-Form's uniform strength comes from high-tensile (90,000 to 100,000 psi), 27 gage, cold rolled steel sheet.

- **Ideal for School**—One of the first construction jobs in which Fab-Form was used was the new St. Regis Church and School in Trafford, Pa. Architect for the job was Ermes Brunettini, AIA, Verona, Pa. More than 33,000 square feet of Fab-Form supports three-inch concrete floor and roof slabs set on steel joists.

Thomas A. Laboon, job superintendent for H. Justin Brown & Son, general contractors from Mt. Lebanon, Pa., said that the deeper corrugations in Fab-Form helped make a stronger slab. Pittsburgh Steel's six-inch square mesh made of No. 6 gage wire was used for reinforcing.

Fab-Form's speed of installation also impressed Mr. Laboon. He said that it took four men just one day to lay 10,800 square feet of Fab-Form on roof joists. After sections were laid, welders using the unique Fab-Form Welding Washer Stick made plug welds to every other joist.

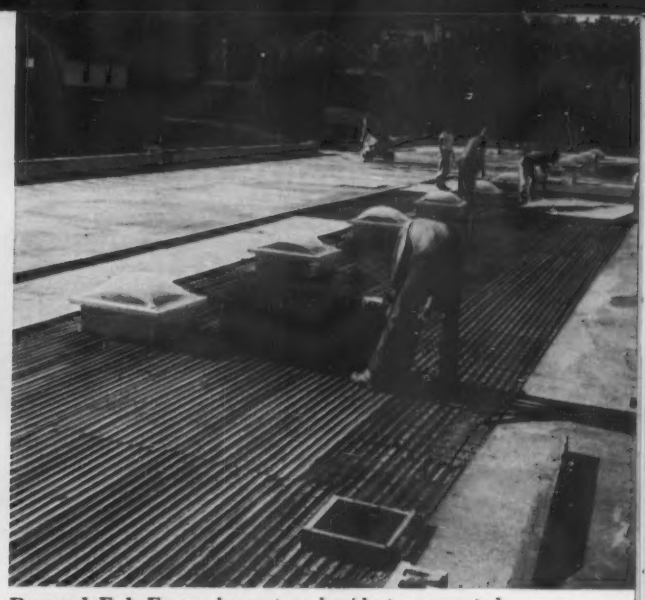
- **Easy as A, B, C**—Welders found using the exclusive Fab-Form Welding Washer Stick unusually simple. Pittsburgh Steel developed the unique stick so that each welder bent up the end washer on the stick, made his plug weld and snapped off the washer—in just seconds. This eliminates fumbling in heavy gloves for individual washers. Next, mesh was installed and the slab was poured.

"Everything came out exactly right with no scrapped material," said Mr. Laboon in commenting on the economy of Fab-Form. "The side and end-lapping worked out exactly right.

"On top of that," he added, "you know that when Fab-Form is down you have a material that will take a beating from men tramping on it, buggies and even rough weather.

"Later, after the slab is poured,

Deepest corrugation, 5/8-inch, of all standard steel centering is available with Fab-Form. Job Superintendent Thomas A. Laboon, left, shown with Pittsburgh Steel Products Salesman C. W. Bainbridge Jr., said deep corrugation helped make a stronger slab.



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Pouring is no problem with Fab-Form. Here a buggy has rolled over Fab-Form without damaging the material. Six-inch square mesh made of No. 6 gage wire is from Pittsburgh Steel, too.

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ANOTHER PRESTRESSED CONCRETE STRUCTURE

Architect Howard Parezo, A.I.A.

Architect's rendering of Grandstand for Minnehaha Fair Grounds, Sioux Falls, S.D.
Prestressed Concrete sub-contractor; Gage Brothers
Concrete Products, Inc., Sioux Falls, South Dakota

Nothing Says More for PRESTRESSED CONCRETE Than the Architects Who Design for it

Here's why it was Chosen for Grandstand in South Dakota

We quote architect Howard Parezo: "In designing the Sioux Falls Empire Fair Association Grandstand, thought was given to wood, steel, concrete and prestressed construction.

"The primary budget was set up on the basis of $150,000, which the county was willing to spend for a 5000 seat, canopied, fire-resistant grandstand. Further, the area under the grandstand had to be enclosed and watertight so that it could be utilized for fair display purposes.

"We investigated concrete first and found it to be too expensive. Second, we investigated wood and found it to be inadequate from many points of view. Though steel by itself came within the budget, the cost of putting a protective coating on it made it too expensive. Prestressed concrete came in more reasonable than any of the others and still gave us a fire-resistant job.

"Another factor was the time element. We were awarded the job in June of 1958 with the proviso that the job was to be completed by August 15 of the same year; opening day of the State Fair. None of the construction methods could be completed within that time allotment except prestressed concrete.

"Total cost of the structure was $131,000—well within our budget. We were able to complete the job within nine weeks—the Fair opened on time with full use of the stands.

"The owners are well satisfied with the structure. Some of their comments included 'The finest grandstand we've ever seen,' 'The seating is comfortable', 'Didn't believe it could be done within the budget or the time limit.'"

Mr. Parezo closes on an equally positive note: "We have used prestressed concrete before and we will consider it for future structures, for permanence, price and construction time."

Change the name of the architect, the type of structure and the location and you have, in substance, the *classic* reasons for the use of prestressed concrete the country over. Terminals, schools, bridges, piers, motels, garages, and warehouses are some of the structures that have been, and are being, built of prestressed concrete.

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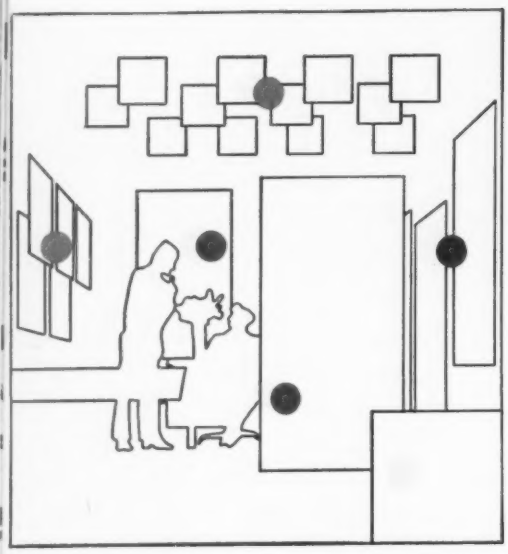

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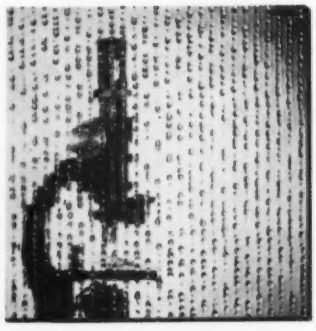

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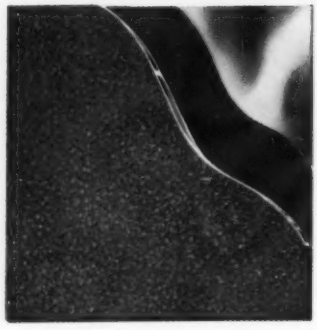

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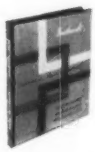

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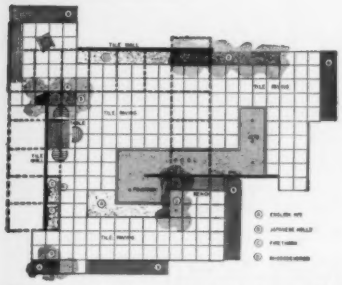

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CERAMIC tile

p/a views

(Continued from page 53)

the various areas in which all of us are experimenting may hurt a little, but is very necessary to remind us of the goal that we must find.

Your last paragraph, in its summation, points out clearly the problems we face. If we can remember ever the end of forming a wonderful environment for contemporary man and also that each of our efforts is only a very small part of a complex total picture, then the fact that we have many directions is good; because the sensitive molding of the surroundings we must have can better be accomplished with a full palette. The restraint we must exercise must come from our respect for humanity and for our present society.

MINORU YAMASAKI
Birmingham, Mich.

●

Dear Editor: I have read "The New Sensualism" with a great deal of interest.

I am, of course, deeply concerned with the use of sculpture in a fixed architectural environment. (The phrase "architectural sculpture" has, by this time, accumulated limited and tiresome connotations.)

From this point of view, it has been apparent for some years that the oft-talked-about "collaboration of the arts," if practised in any traditional sense, is totally inadequate. It neither gives sculpture a proper setting nor (more important) relieves, enriches, or even remotely affects the forest of curtain-walled glass-and-concrete boxes our cities have become. The scale is too vast; the background material and building techniques too changed; the speed and distance from which the work is viewed too great. Any of the accepted juxtapositions of sculpture with architecture become small and futile. This is not a particularly original observation. But because a problem has been repeatedly stated does not mean that it has been solved.

The various trends which you have described are exciting, promising, and perhaps dangerous, as they could go terribly "corny." But they, or some equivalent, are inevitable as a means of reintroducing some of the intensification and enrichment of form and meaning

(Continued on page 64)

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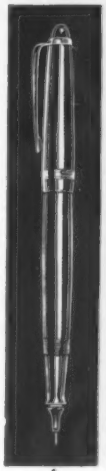

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"Telephone planning is just the kind of built-in convenience home buyers want"

—SAYS CHARLES V. SIMMS, CUSTOM BUILDER OF DAYTON, OHIO

"You can't ignore what people want," says builder Charles Simms, of Dayton. "People *do* want telephone-planned homes today.

"Five years ago, pre-wiring a home for telephone service was a special feature few people expected. Today, they ask about it, even insist on it. They appreciate the convenience of having built-in telephone outlets throughout their home—and the common sense of having wires concealed inside the walls, with only neat outlet plates visible."

Mr. Simms builds custom homes priced from $18,000 to $40,000 with as many as *nine* telephone outlets in them. They are advertised as "Communication Conditioned" homes.

"A builder has to merchandise his product," says Mr. Simms, "and telephone planning is good merchandising. The public wants this feature—and the telephone company makes it practical to offer it, costwise."

Your local Telephone Business Office will gladly help you with telephone planning for your homes. For details on home telephone installations, see Sweet's Light Construction File, 8i/Be. For commercial installations, Sweet's Architectural File, 32a/Be.

BELL TELEPHONE SYSTEM

The builder and telephone representative Mary Ellen Sears stand before "The Brookfield" —chosen Dayton's "Home of the Year"—in Mr. Simms' Spring Valley Acres development.

Embodying the latest concepts in styling and structure, the new Community Savings Bank of Rochester, New York, provides attractively modern and efficient quarters for banking operations as well as top-quality rental space.

Air conditioned throughout, the building offers an ideal thermal environment under the direction of a Johnson Pneumatic Control Center.

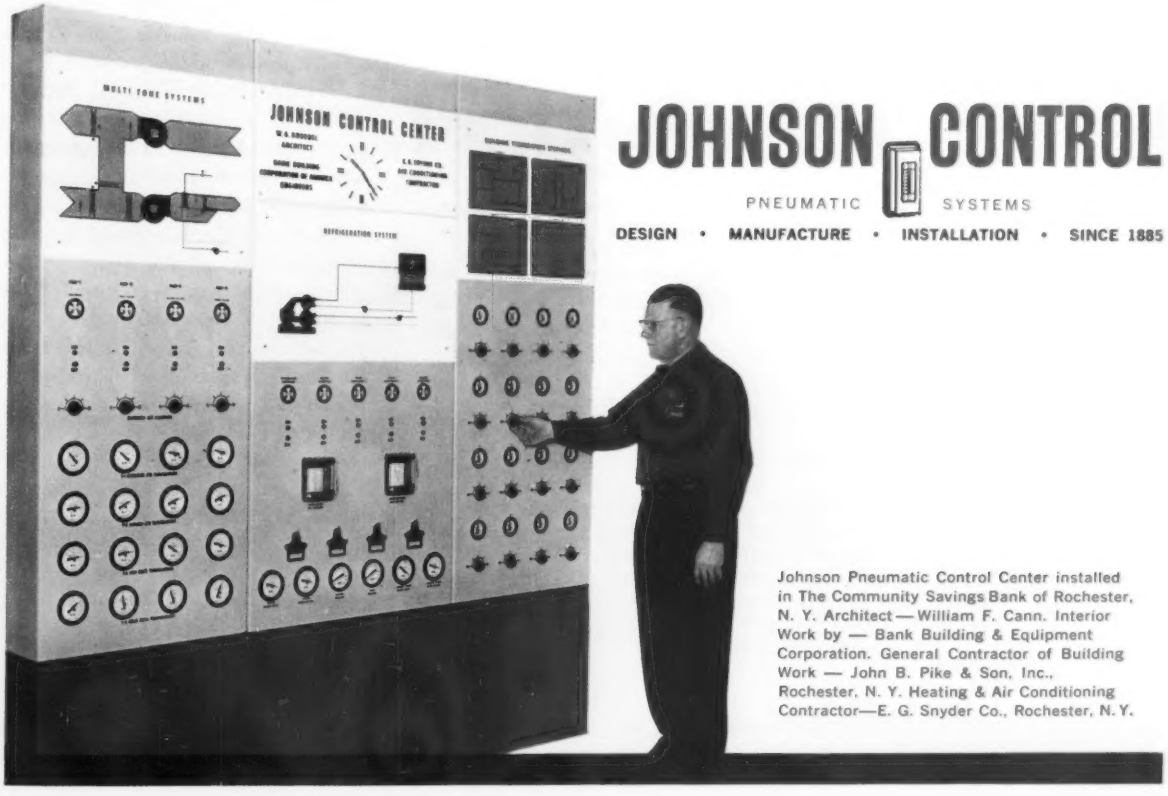
From the Center the engineer operates four central multi-zone systems that supply conditioned air to 16 individually controlled zones. The temperature in each zone is indicated at the panel and can be reset, if required, from this central point to assure continuous comfort. All equipment can be started and stopped pneumatically from the Center.

The impressive advantages of centralized pneumatic control make it practical for smaller commercial buildings such as this as well as the larger buildings. It makes a building more profitable to operate . . . simplifies an otherwise complex job, cuts fuel and power consumption, prolongs equipment life. It saves an untold amount of time, minimizes the supervision required. And it assures a consistently comfortable climate for business efficiency.

A nearby Johnson engineer will gladly explain how a Johnson Control System with a Pneumatic Control Center can be applied to any new or existing building. Johnson Service Company, Milwaukee 1, Wis. 105 Branch Offices.

ASSURE A MODERN CLIMATE FOR BUSINESS

with Johnson Pneumatic Control



JOHNSON CONTROL

PNEUMATIC SYSTEMS

DESIGN • MANUFACTURE • INSTALLATION • SINCE 1885

Johnson Pneumatic Control Center installed in The Community Savings Bank of Rochester, N. Y. Architect — William F. Cann. Interior Work by — Bank Building & Equipment Corporation. General Contractor of Building Work — John B. Pike & Son, Inc., Rochester, N. Y. Heating & Air Conditioning Contractor—E. G. Snyder Co., Rochester, N. Y.

(Continued from page 61)

which, in the past, were supplied by architectural ornament and applied art.

Whether the architect will learn more about sculpture—or the sculptor will work directly in the planning stage—is a question with many answers. Meanwhile, it is interesting to note that the most successful recent examples of sculpture in conjunction with architecture have occurred when the sculptor was forced by the sheer scale of his problem to put aside the concept of making a "piece of sculpture" and had instead to work out a sculptural solution to an area or wall.

ROBERT CRONBACH
Westbury, N. Y.

•

Dear Editor: Three cheers for Sylvester! Let's admit that he has a good point.

Your treatise on Sensual Architecture (which I assume you intended* to be "sensuous") lists "important" architectural works and what you consider to be "trends." Some of the prize examples, however, fall outside the class of outstanding achievements. Are we to respect a trend traveling askew?

When an architect creates a "dud," let's acknowledge it, even if he is a big name. At least use the soft pedal. No architect's batting average can be a thousand.

After another 20 years and another 20 million words, architecture may arrive: *i.e.* where the façade disappears; where the ornament will *be* the structure; where the plasticity is the *space* enclosed; where proportion is related to *people;* where the senses are tingled with inspiration; where Frank Lloyd Wright was 30 years ago!

BENJAMIN DOMBAR
Cincinnati, Ohio

•

Dear Editor: In SEPTEMBER 1959 P/A, you offer a fresh commentary on some examples of contemporary architecture and dub it a "trend" or "pro-sensualism urge," and call it "The New Sensualism."

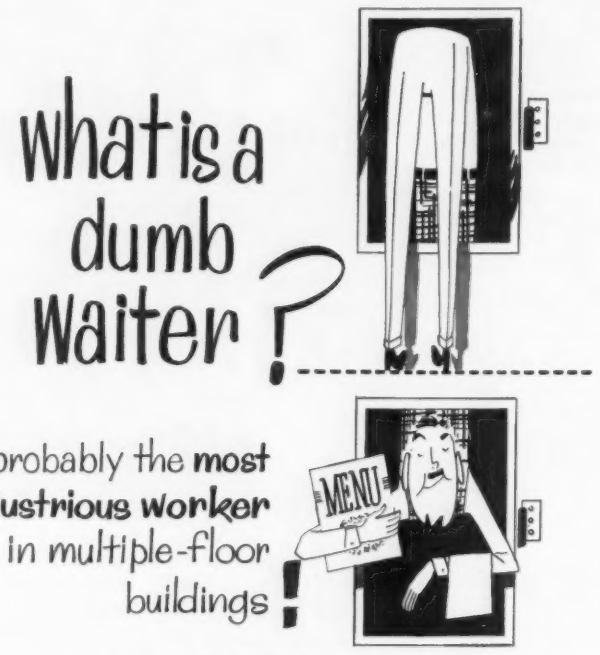
What makes it "new"? In the article, you go back as far as 1941 and Giedion, or even '46 with Niemeyer. I can go back to 1930 and Le Corbusier, when I had such difficulties of language that his "free form" approach could be delivered only graphically with an exceptional facility of eye and hand. His concept was a touch of humanism, despite all his geometrics. Have you studied his road patterns?

Nor should you, with your broad knowledge of architectural history, forget the Taj Mahal and Hagia Sophia, St. Mark's and the early Renaissance Duoma of Brunelleschi, and the sensuous delight of Burmese and Chinese temples and pagodas.

Since every epoch has developed new materials and techniques and new avenues of form evolve, the "delight" of expression to more and more sculptural concepts becomes evident. To quote Geoffrey Scott, "a combination of plastic

(Continued on page 68)

*We accept Webster's usage of "sensualism" when related to esthetics: i.e. "Stress on the sensuous qualities of an object or on the sensuous as the chief element of beauty." C. M.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MENU
here's why... A dumb waiter lifts vertically loads of every description between floors faster and easier than any other method of transportation – just by pushing a button. It reduces work loads, saves valuable man hours and increases overall efficiency.
To stand the use and abuse that it must, a dumb waiter must be carefully and soundly engineered. Emphasis should be on safety, sturdiness, heavy duty construction and most important – dependability. You can protect your clients by specifications that will insure this dependable service. Let Sedgwick study your lifting problem, make recommendations, submit suggested specifications and prepare preliminary sketches of hoistway requirements. This is a free consultation service based on over 65 years of specialized experience offered by Sedgwick.
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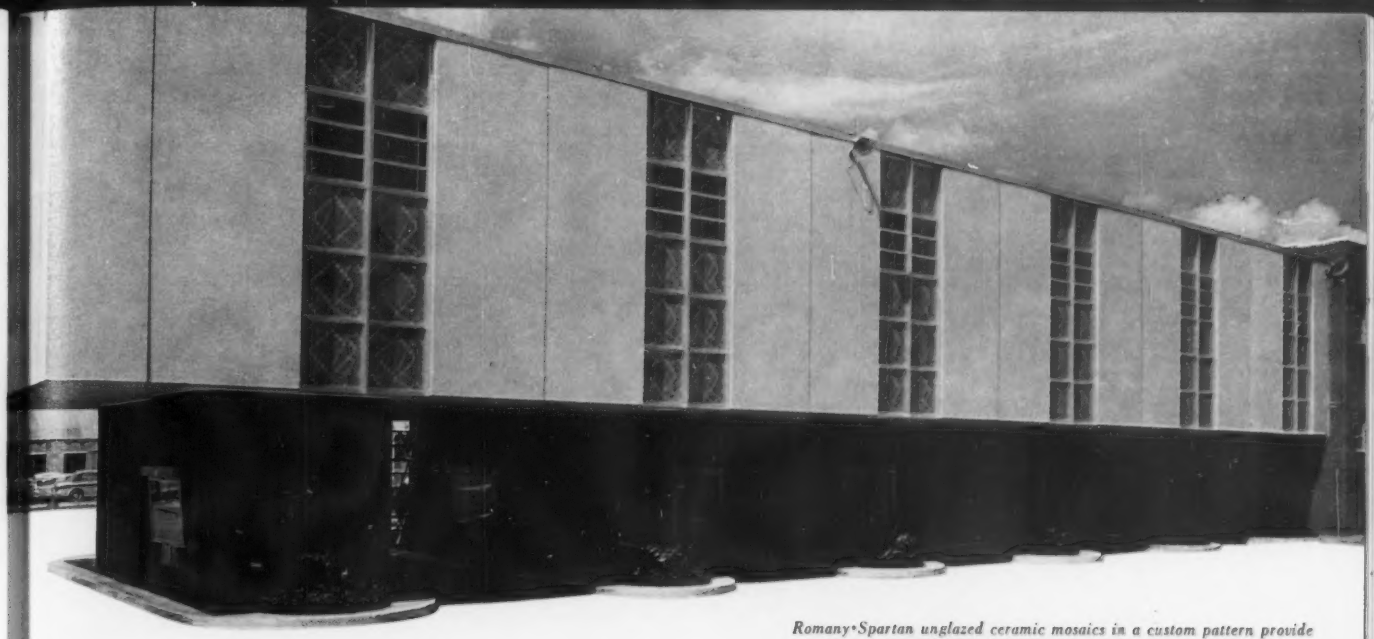

Romany•Spartan unglazed ceramic mosaics in a custom pattern provide the exterior wall finish for Orlando's new Citizens National Bank.

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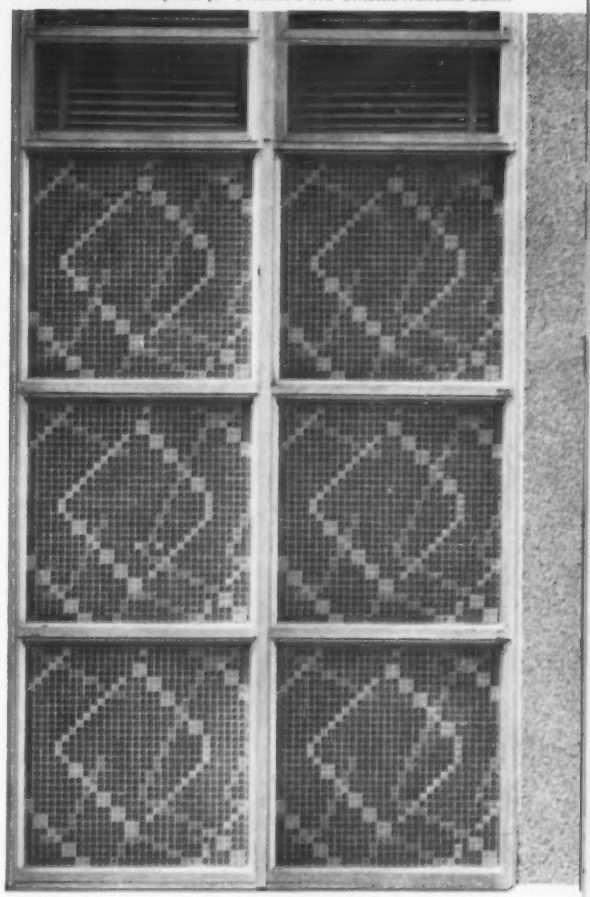
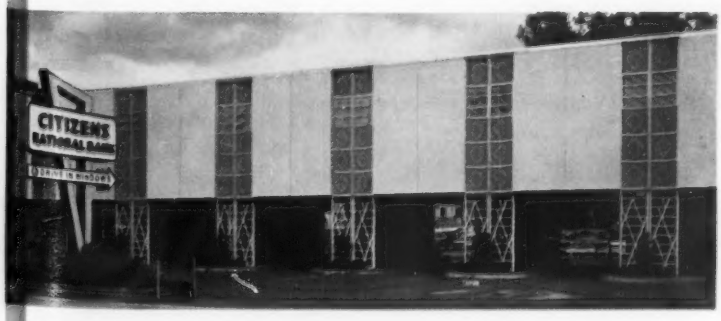


Plate No. 1090



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Architects:
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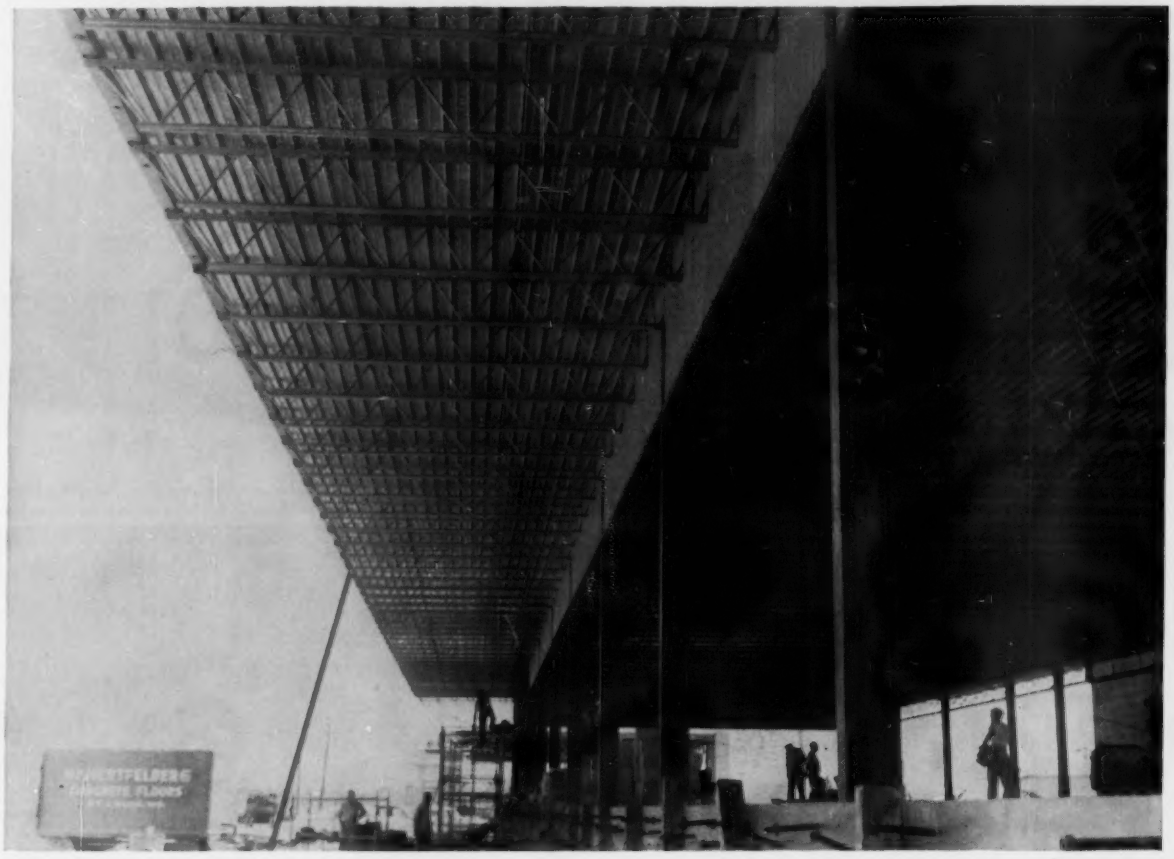

So practical . . . so efficient! A modern truck terminal of

LACLEDE OPEN WEB STEEL JOIST CONSTRUCTION

An example of simplicity yet highly efficient construction is the new Lee Truck Terminal in St. Louis.

64′ Laclede open web steel joists span the entire roof width of the long structure. These extra-length joists provide 40′ of the interior ceiling width, plus a 12′ overhang on each side.

Erection was simplicity itself: joists were set on supporting beams . . . stabilized with continuous horizontal bridging . . . overlaid with steel roof decking.

Another unique feature: overhead doors swing *out*, instead of in . . . are supported by the overhanging joists.

The Lee Truck Terminal was designed by architects Wedemeyer & Hecker and built by Millstone Construction Co., Inc. Consulting engineer was Otto E. Heinicke.

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The Golden Door Restaurant, New York International Airport Designed by the Knoll Planning Unit. Scott Hyde photograph

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May we send you information on the Knoll office furniture collection and international facilities?

(Continued from page 44)

forms has a sensuous value apart from anything we may *know* about them." And again, "In architecture the universal term is the sensuous experience of substance and form. It may begin as a sensuous perception, but as such it is necessarily more transient and occasional than its remembered significance, and more isolated and particular than when fused by reflection with the rest of our remembered life . . . there is, therefore, so to say, a literary background to the purely sensuous impression made upon us by plastic form, and this will be the more permanent element in our experience." This in 1914!

With our new concepts of space enclosure becoming less academic, dry, and formal, there will no doubt be numerous self-conscious efforts to develop more sculptured or plastic buildings. We ought to recognize this as a result of our freedom from architectural and social conformity; and to a certain degree a search for an expression of our new social mores, new materials, and new techniques.

In addition, the psychologists have indicated quite often that the sublimation of the libido affects the creative process in all areas, including the arts. Perhaps the examples of free-form structures flowing from the pencils of our designers are nothing but "over-sexed" architecture.

I close with my opening question—is the "New Sensualism" new?

LEONARD SCHEER
New York, N. Y.

•

Dear Editor: I have read your "New Sensualism" article—it is good—you always write well—but, personally, I would not have mixed certain sheep with certain goats—and I think you have made too large an umbrella encompassed by one name. (Egocentrically, I prefer the division Robin Boyd made in the September *Harper's.*)

It seems to me, when I think of it more, that the whole business about using sculptors as consultants is not very good. Yes, you can condemn us for being bad artists in 3-dimensional form, this is your privilege; but don't saddle us with impractical ideas of having sculptors become the artists for us—because their comprehension of a problem is (and should be) entirely different!

EERO SAARINEN
Birmingham, Mich.

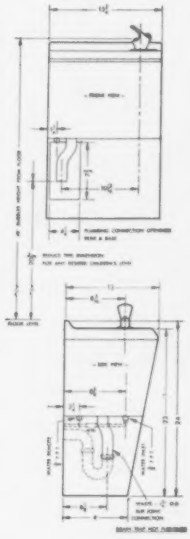
•

Dear Editor: Your survey has a historical significance particularly for me, as it brought back to memory my greener years of a 'teenager-Futurist idealizing Frank Lloyd Wright and Sant'Elia.

Even then, the dichotomy between Architect and Engineer was a retarding drag in the progress of Architecture; and now the situation is aggravated by the developments of technology.

As a Lone Wolf, perhaps a bit mesmerized, I am hardly qualified to comment on the work of the creative designers you have presented and *nosce te ipsum* is a most difficult evaluation for a man to make of himself.

(Continued on page 236)



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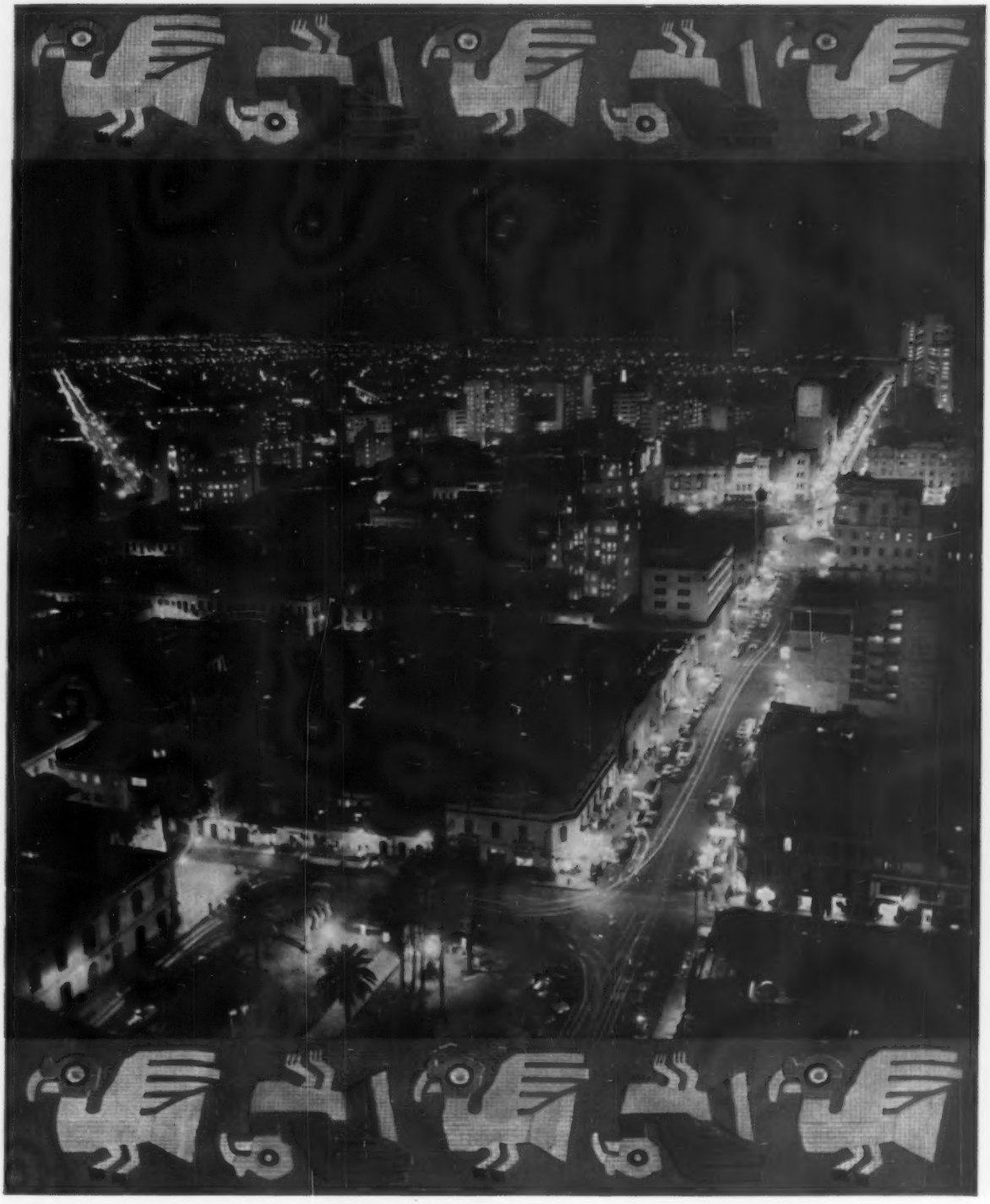

LIMA *is the Capital of Peru where native weavings have been traced back as far as 2,000 B.C., predating ceramics. Lima, "City of Kings," with a population of 1¼-million, has long been noted for its many examples of fine Spanish architecture. Today, dramatically contrasting modern buildings tower above the streets trod by "conquistadores" who founded Lima in 1535. In a city where quality is a tradition, it is highly complimentary to have the OTIS tradition for quality recognized by progressive builders who prominently display the slogan "Mas Ascensores OTIS" (More OTIS Elevators)—the world's finest.*

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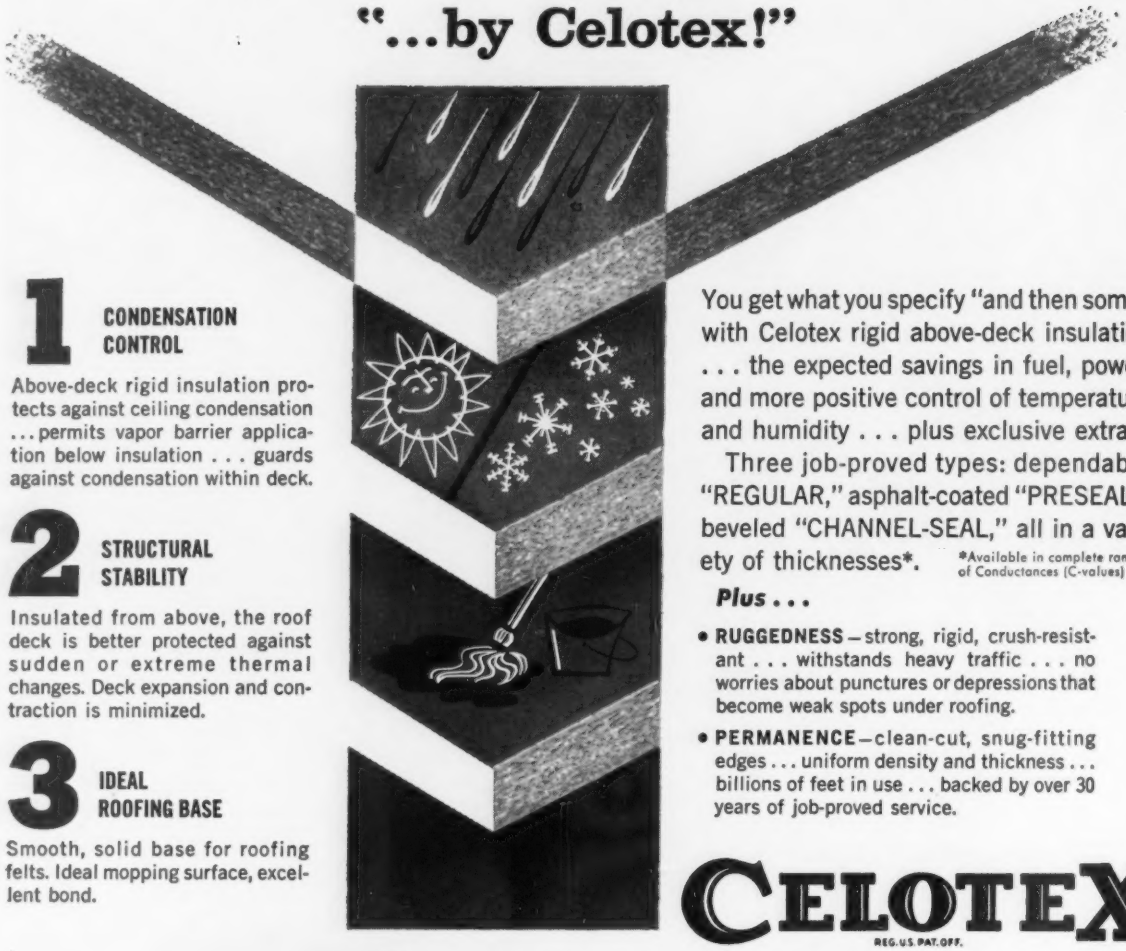

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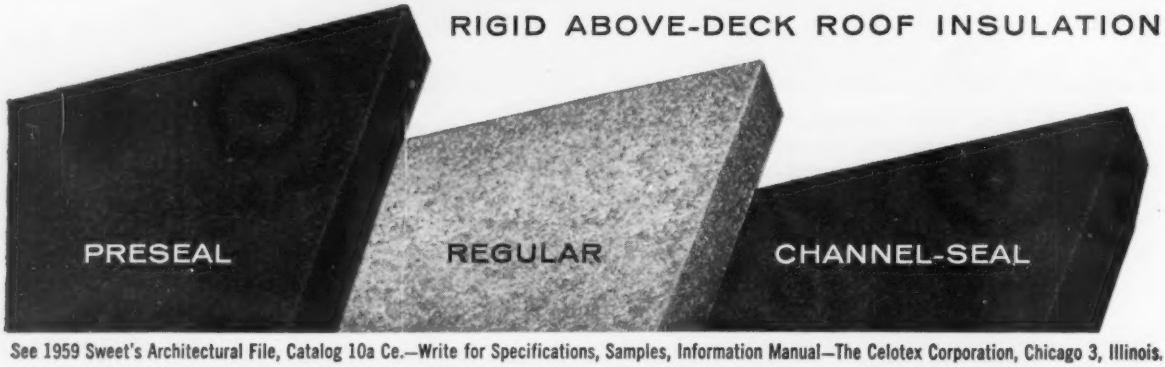

See 1959 Sweet's Architectural File, Catalog 10a Ce.—Write for Specifications, Samples, Information Manual—The Celotex Corporation, Chicago 3, Illinois.

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These efficient Executive and Secretarial Units are typical of the many different arrangements and color combinations possible with Columbia Nine-to-Five components.

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where reliability replaces probability

The colorful tiled entrance lobby, illuminated at night, adds to the exterior beauty of the new Hellertown-Lower Saucon Joint High School, Hellertown, Pa.

THE NEW HELLERTOWN HIGH SCHOOL USES

The cafeteria, with its tiled walls, is easily kept spic-and-span. Facing Wall: SD-1, 81 Spruce Green and 97 Gardenia. Drinking fountain wall and floor: 1⅛" squares, Deep Blue. Side Wall: 1⅛" squares, Medley Blend in Gray Granite, Deep Blue, Yellow and Red. Floor: Murray Quarry Tile. Color Plate 407.

Even the counter-front on this sparkling snack bar is tile—proof against young customers' scuffs and kicks. In 1⅛" squares, Medley Blend of Gray Granite, Deep Blue, Yellow and Red. Inside Wall: 4¼" squares in 72 Dawn Gray. Wall Column: SD-1, 33 Nutmeg. Color Plate 408.

Walls are S

CE

In des
selecte
usage
tile's
school
satility
distinc
fresh,

*PAT. APPLIED

AMERICAN
LANSDALE,

Walls are Scored Tile*, SD-1 in vertical stripes of 72 Dawn Gray, 58 Vellum, 50 Cream, 32 Tan Glo and 49 Gloss Black. Color Plate 406

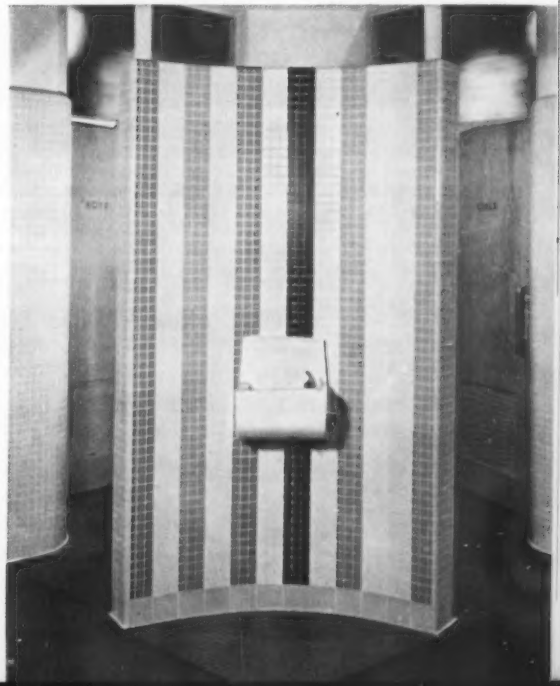
CERAMIC TILE FOR BEAUTY AS WELL AS DUTY

In designing this new school, Architects Heyl·Bond·Miller selected American Olean ceramic tile . . . "not only for hard-usage areas—in corridors, washrooms and kitchens where tile's durability and utility make it an obvious choice for schools—but also for 'show' areas where its beauty and versatility could be exploited to the fullest". The result: a distinctive school interior that is, and always will be, fresh, inviting, colorful—and practically maintenance free.

*PAT. APPLIED FOR

Tile Contractor: Allentown Tile & Marble Company

Splash-proof drinking fountain niche repeats the decorative striped treatment of the entrance lobby. Wall: SD-1 in 72 Dawn Gray, 58 Vellum, 50 Cream, 32 Tan Glo, 49 Gloss Black. Base: 38 Butternut. Floor: 1 1/16" squares, Slate Textone. Color Plate 409.



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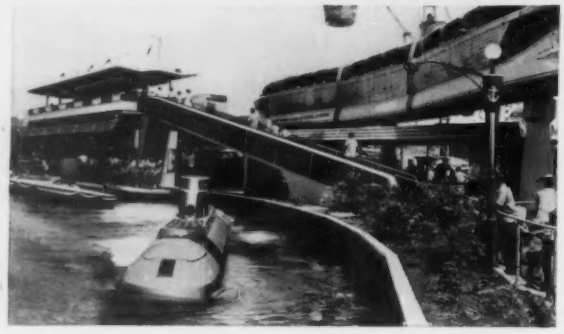
DISNEYLAND, CALIFORNIA — JUNE 15th



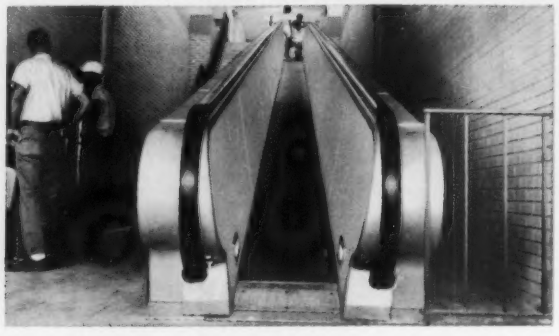
An S-A SPEEDRAMP Passenger Conveyor carries visitors to the Monorail station where they board trains of the Disneyland-Alweg Monorail System . . . the first daily operating monorail in the United States. This SPEEDRAMP installation is a part of the fabulous new attractions visited by millions this summer at Disneyland '59. This modern mode of transportation was unveiled June 15 to a coast-to-coast TV audience and also received acclaim in nationwide publicity.

The first successful commercial passenger conveyor or "Moving sidewalk" was put into operation several years and some millions of safe passenger miles ago. Yet, month after month, SPEEDWALK Passenger Conveyor Systems continue to make news in the mass transportation field. Shown here, are but three typical examples of SPEEDWALK Big News events for 1959.

NAVY PIER, CHICAGO — JULY 17th

The press featured the fact that one new way of transportation — the St. Lawrence Seaway — became the mode of transportation for a second new system of travel — "the moving sidewalk," July 17th. It all came about when the Nordlake Line's S.S. KAARINA steamed away from her Navy Pier Dock, bound for Europe with the first passenger conveyor belt system destined for overseas installation. The SPEEDRAMP Passenger Conveyor will be placed in service at Lausanne, Switzerland, in the ultra-modern "Innovation" Department Store.

ATLANTA, GEORGIA — AUGUST 3rd



City-size Lenox Square Shopping Center, one of the world's most beautiful, most complete and without question most modern shopping centers, opened its doors to the Atlanta, Georgia area public, on August 3rd. The million square foot shopping center became the first of its kind to offer customers the advantages of a "Moving sidewalk."

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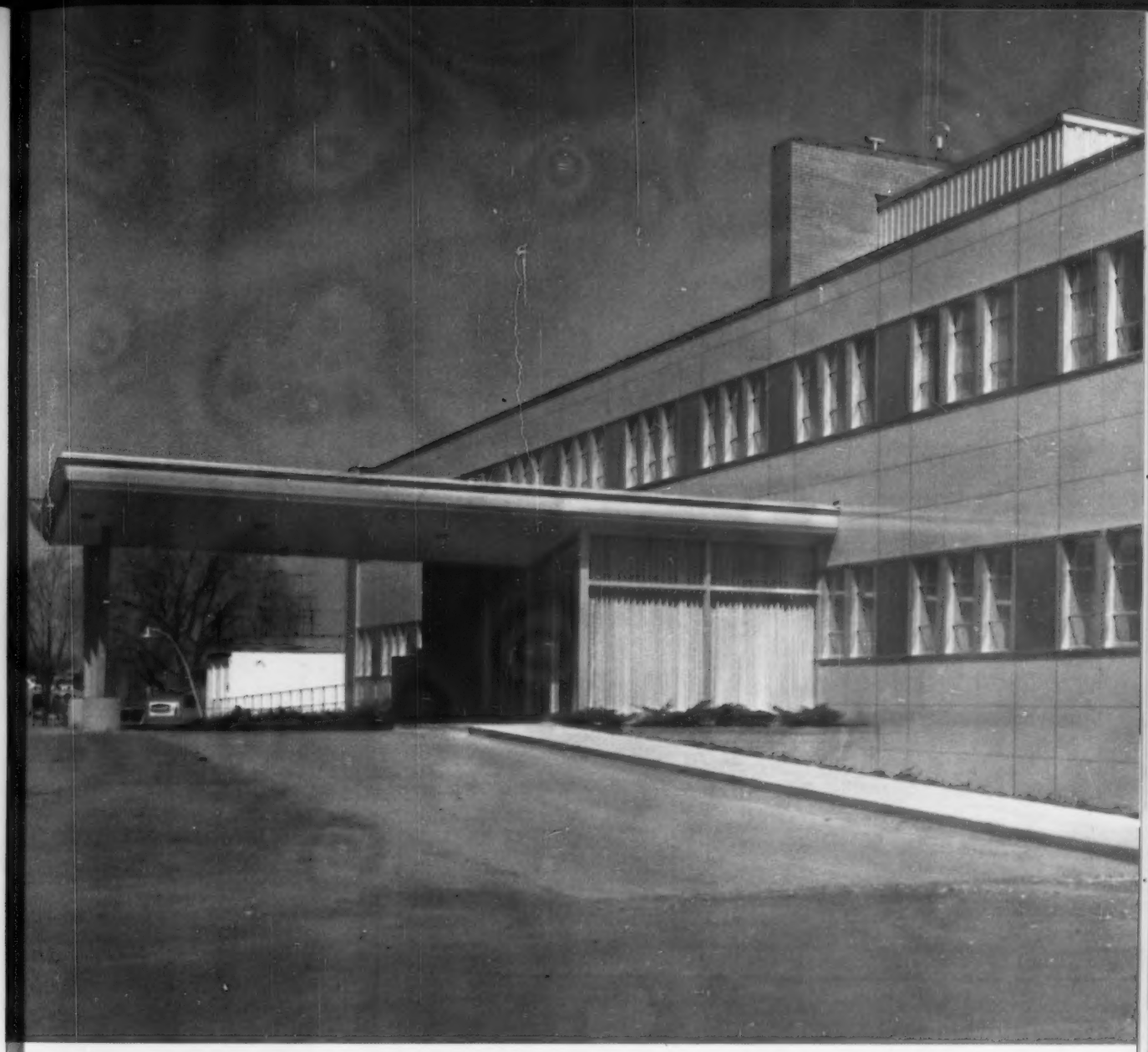


Flint Medical Arts Building, 2765 Flushing Road, Flint, Michigan.

WHAT THE ARCHITECT CONCEIVES . . . ALUMINUM ACHIEVES

ARCHITECT: Brice McMillen, A.I.A.

ENGINEER: Stuart D. Long

GENERAL CONTRACTOR:
Sorensen-Gross Construction Company

ALUMINUM SUB-CONTRACTOR:
Koert's Glass & Paint Company

KAISER ALUMINUM

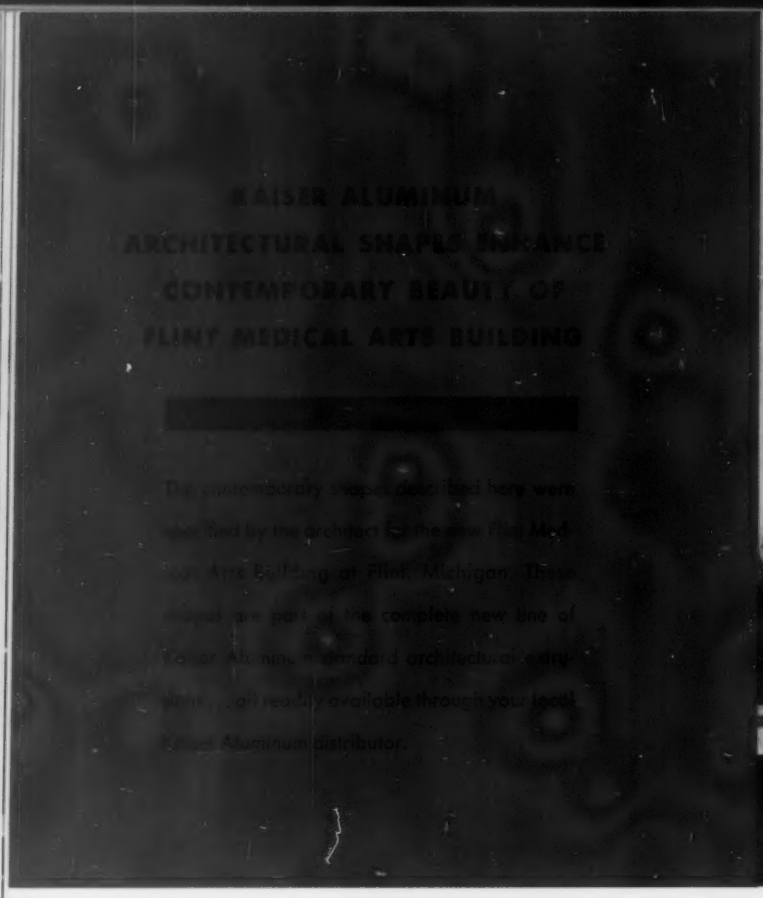
To create an over-all feeling of distinctive quality for this medical building facade, the architect chose a standard Kaiser Aluminum facing system with gold color finish.

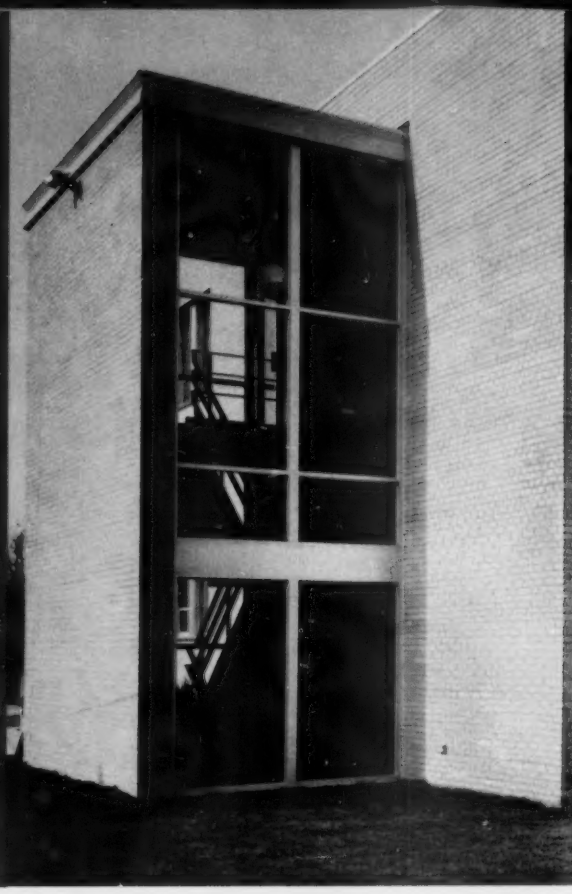
It is an economical choice as well as an aesthetic one.

The facing system components, readily available from Kaiser Aluminum distributor stocks, greatly reduce costs for material and labor, and for maintenance later on.

And with their gold-anodized finish, the ribbed aluminum extrusions between windows provide distinguished color and texture contrast to the green porcelain-enameled flat panels above and below.

Please turn the page for more information on the architect's use of this facing system and other Kaiser Aluminum standard architectural shapes.



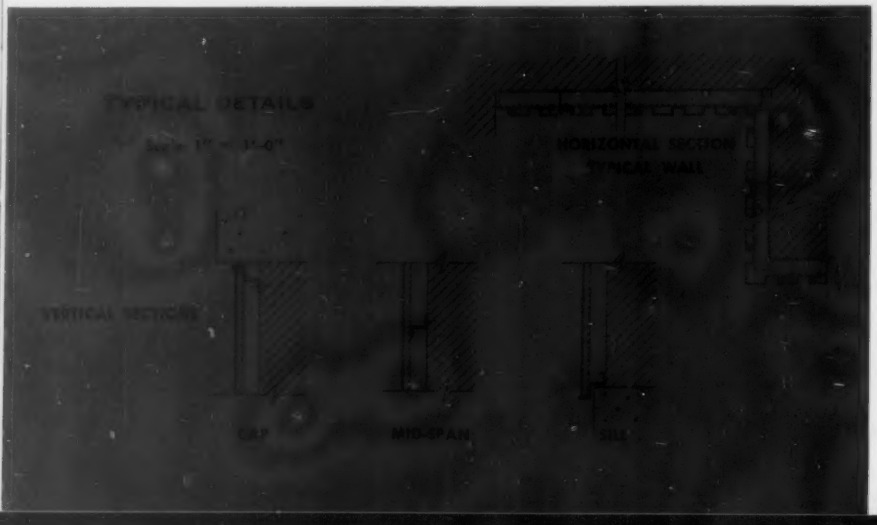


STANDARD ARCHITECTURAL ALUMINUM FACING SYSTEM

With alternating shallow channels and raised flats, these gracefully-designed extruded panels provide a textured effect of highlights and shadows. In the Flint Medical Arts Building, the facing panels are secured to aluminum furring members anchored to the masonry backup.

This versatile facing system is made up of only seven basic interlocking sections plus a cap and sill stop and furring zee.

(A complete description of the system is contained in a new Kaiser Aluminum brochure. For your copy, send coupon on back of next page.)



STANDARD ARCHITECTURA
ALUMINUM WINDOW SIL

For the Flint building, Kaiser Aluminum T
A window sills were used with alumi
windows. They may also be used with w
or steel windows.

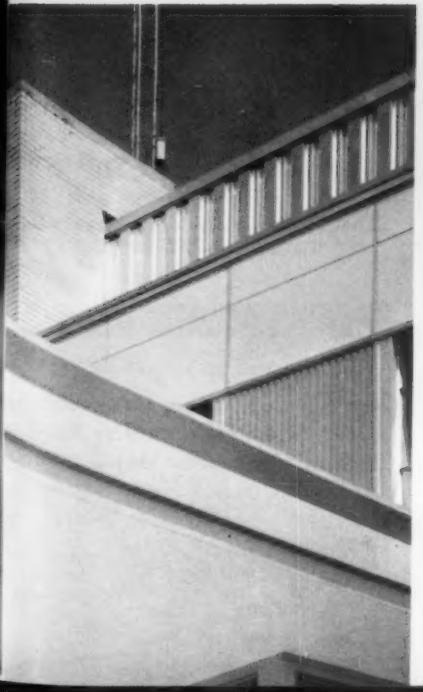
Although these sills can be used wit
types of wall systems, they were desig
for use chiefly with masonry walls, affor
weathertight, non-staining, maintenance
protection over mortar joints.

STAN
A

On mason
Kaiser Alu
standard a
12" thick
and is spe
damage.

STANDARD ARCHITECTURAL ALUMINUM COPING

On masonry end walls of the new building, Kaiser Aluminum copings were installed. The standard coping system, available for 8" and 12" thick walls, features a straight drip edge and is specially engineered to prevent weather damage.



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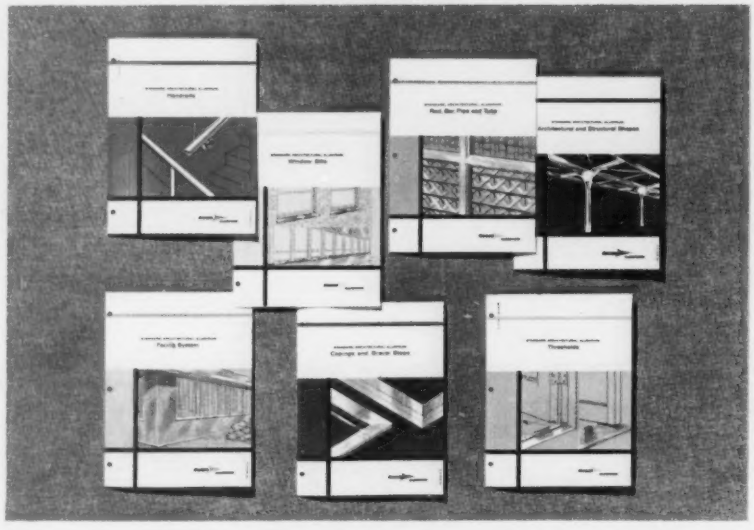

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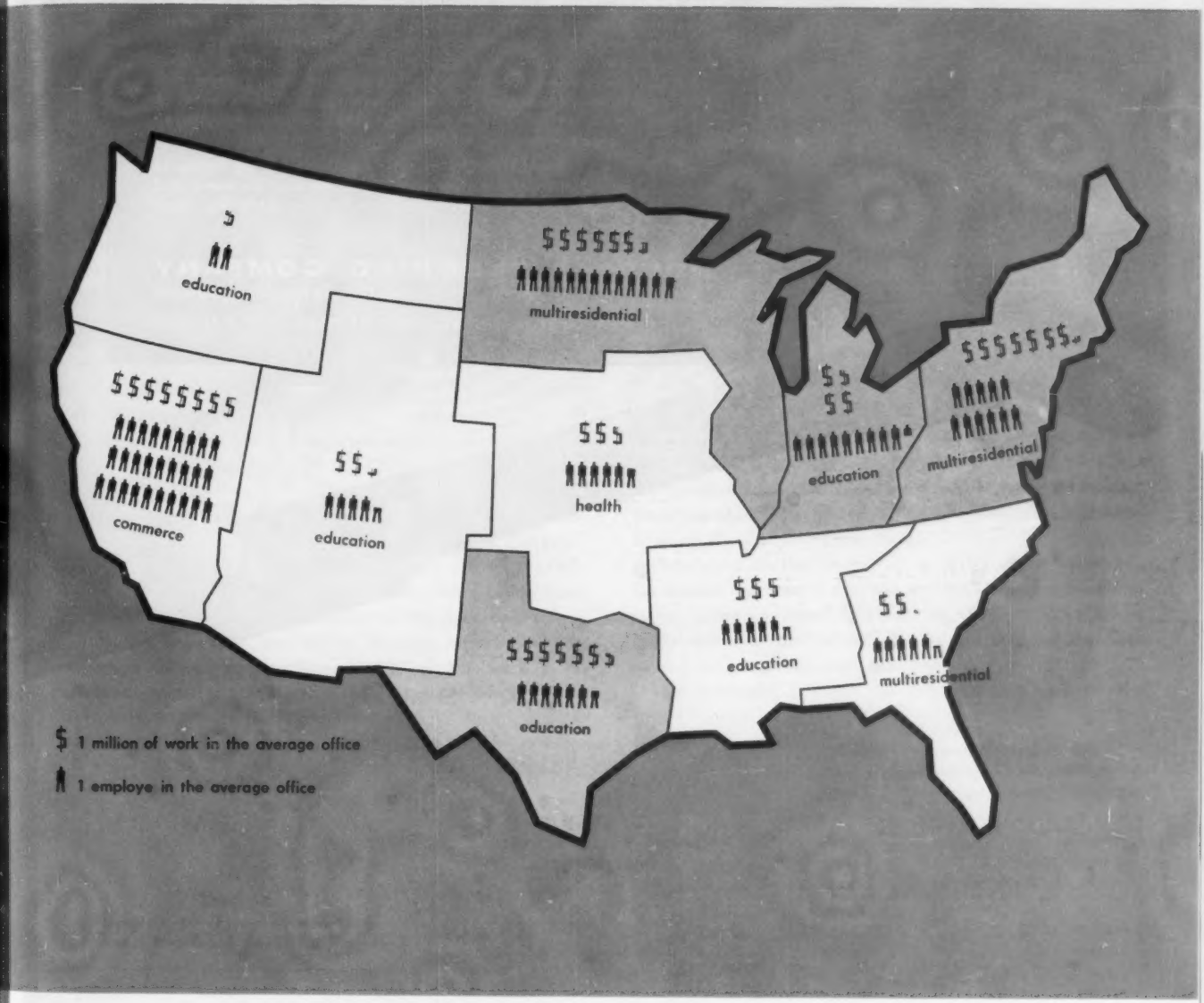

- Architects' Business Expected To Rise 20% in 1960
- Guggenheim Museum Holds Long-Awaited Opening
- Exciting Embassy by Saarinen Opens Under Fire
- Timber Is Fireproofed by Pressure-Treating Process

NEWS BULLETINS WASHINGTON NEW PRODUCTS MANUFACTURERS' DATA

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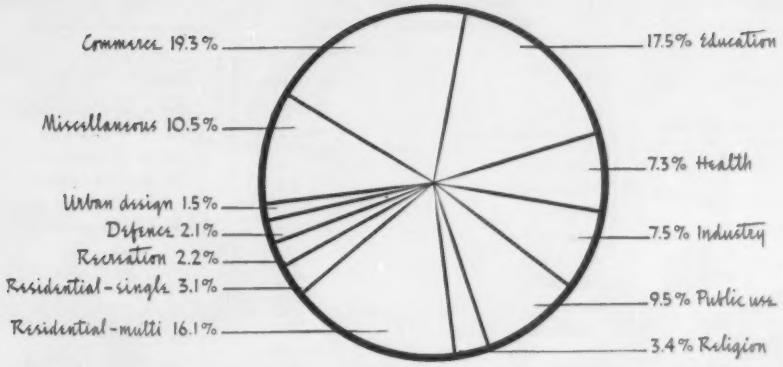


ARCHITECTS' BUSINESS EXPECTED TO RISE 20% IN 1960

Results of Annual P/A Business Forecast

A profitable year in architecture is forecast for 1960 by results of the Tenth Annual Business Survey of the profession conducted by PROGRESSIVE ARCHITECTURE. Tabulations of the answers by 800 architects throughout the United States, reveal that the dollar volume of work in the average office may rise 20%—from $4,307,142 in 1959 to $5,166,798 in 1960 if the effects of the prolonged steel strike and litigation over the Taft-Hartley Act do not cause cancellation of some new commissions and work in various stages of design. The Survey was conducted in early Fall to prepare data for reporting now. Pie chart above shows percentage distribution by building categories in the average firm.

Slightly more than half of the business reported is decidedly "future" construction—51.4% of the work is in preliminary design stage, and 48.6% is presently in working-drawing stage. There is a great increase in work for private clients. In 1960, according to the Survey, 70.1% of work will be for private clients, and 29.9% for public agencies. In 1959, 51% of the business was reported in the private category, and in 1958 the percentage was 54.4%. This would seem to indicate the effect of either retrenchments on the part of local, state, and Federal governments, or the record of the last Congress in holding back on many construction bills.

Compared to the decline in work for public agencies, the healthy increase in average dollar volume for the Commerce category—from $794,653 in 1959 to $996,824 in 1960—indicates that private clients will take up the slack caused by less public work next year.

The continued strength of Education as part of the

Chart (above) and map (page 79): Nicholas Loscalzo

Table 1
Number of Firms Reporting and Regional Distribution

Region	% of Firms
Northwest	4.0
North Central	11.0
Great Lakes	11.2
Northeast	24.2
Southeast	9.4
Gulf States	6.2
Central States	6.8
Texas	7.6
Western Mountain	5.1
California-Nevada	14.5
Total Returns: 800	100.0

Valid returns in P/A's Survey totalled 800. Regional distribution of returns remained approximately the same as in past Surveys.

Table 2
Average Dollar Volume by Regions

Region	Average $ Volume
Northwest	$ 656,000
North Central	6,472,357
Great Lakes	3,788,976
Northeast	7,199,879
Southeast	2,043,644
Gulf States	2,998,927
Central States	2,761,635
Texas	6,566,290
Western Mountain	2,288,769
California-Nevada	7,851,567
National Average	$5,166,798
National Median	$1,250,000

California-Nevada maintains its lead in regional dollar volume, even though the region expects a 16.3% decline from last Survey. Texas reports a fabulous 240.3% jump in average volume, bringing it from second lowest in 1959 to third largest in 1960.

Table 3
Dollar-Volume Averages and % Distribution of Work by Types of Buildings in All Regions

Type	% of Average Architect's Work	$ Volume Average Office
Commerce	19.3	996,824
Defense	2.1	109,437
Education	17.5	903,531
Health	7.3	377,441
Industry	7.5	388,638
Public Use	9.5	489,503
Recreation	2.2	113,613
Religion	3.4	175,738
Residential (Multiple)	16.1	831,297
Residential (Single)	3.1	161,928
Urban Design	1.5	75,169
Miscellaneous	10.5	543,679
Total (average office, all regions)	100.0	5,166,798

Design for Commerce regains the lead forecast in the 1958 Survey, with a 25.4% increase over 1959. A steep, 111.9% increase was reported in Multi-Residential, and Single Residential rose 76.0%. The greatest decreases were in Industry (35.4%) and Public Use (29.1%).

Table 4
Activity of Architectural Firms in Types of Buildings

Types of Buildings	% of Architects Reporting Current Work
Commerce	49.0
Defense	5.0
Education	46.0
Health	23.0
Industry	21.0
Public Use	23.0
Recreation	15.0
Religion	38.0
Residential (Multiple)	29.0
Residential (Single)	49.0
Urban Design	3.0

The distribution of most types of work throughout architects' offices seems to be quite healthy, despite the 10.8% of the firms in Table 5 reporting a tendency towards specialization.

Table 5
Specialization of Architectural Firms

Types of Buildings	% of Firms doing only this type
Commerce	2.4
Education	2.8
Health	.3
Industry	.8
Public Use	.3
Religion	1.2
Residential (Multiple)	.8
Residential (Single)	2.2
Total Specialists	10.8

Firms specializing in one class of building are 1.9% fewer than in the 1959 forecast. This continues a slight decline in specialization which has been noted over the years.

Table 6
Sizes of Architectural Firms

Size of Firm by Number	% of National Total
Up to 4 employes	55.4
4 to 9 employes	22.7
10 to 19 employes	13.4
20 to 39 employes	5.0
40 to 100 employes	2.3
over 100 employes	1.2
	100.0

Size of Firm by $ Volume of Work on Boards	% of National Total
Under $1 million	43.4
$1 million to $10 millions	47.5
$10 millions to $50 millions	8.0
Over $50 millions	1.1
	100.0

Size of firm by number of employees seems to be shifting slightly from the small firm—still the backbone of the profession—to the "small-medium-sized" firm. Size of firm by dollar volume remains practically the same as in the last Survey.

average architect's practice reflects, as it did in 1959, not only the local elementary or secondary school, but also the continuing and increasing emphasis on the college and university commission.

An interesting development is the strong position that design of Multiple Residential projects takes in the current Survey. A whopping increase of 111.9% is reported! Work in this category accounted for $392,257 of the average architect's business in the 1959 Survey; in 1960 this dollar volume will be swelled to $831,297. This situation was recently illustrated by the entries in the Multiple Residential category of P/A's 1960 Design Awards Program—20% more than last year.

On the decline side, the largest dollar-volume drop is registered in the Industry category, down 35.4% from 1959. This is a category which frequently can be greatly swelled by the inclusion of one or two gigantic projects, so this decrease may not be actually cause for alarm. The possibility that such factors as the steel strike may have had an effect on this category should also be considered. The decline in Public Use buildings by 29.1% reflects the switch in architectural business from the public to the private client.

California-Nevada maintains its lead in regional dollar volume, although architects in those states report a 16.3% decline in average dollar volume from 1959's $9,382,730 to $7,851,567 projected for 1960. The greatest gain is reported by Texas—$6,566,290 as opposed to the previous period's $1,929,556; a gain of 240.3%. Conceivably, this reflects a number of Texas-size commissions from several scattered firms (one firm reported $175,000,000 in business for 1960!). Other regions reporting increases are North Central (76.5%), Northeast (45.8%), and Great Lakes (2.5%). The Northwest keeps its 1959 position as "anchor man", with the smallest dollar volume per average firm. The decline in this territory is reported as 30.6%, and the Northwest is the only region whose average firm will have less than $1,000,000 worth of business in 1960. The shaded areas on the map (page 79) report more work, on the average, than last year.

The trend noted in past P/A Business Surveys toward the average size office and away from the small, one to four man practice, will continue in 1960. The small office still accounts for 55.4% of firms, but it is interesting to note that the four to nine employe office will increase 3.7% and the 10 to 19 man operation will rise 4.0%. In 1960, average size office (4-19 men) will account for 36.1% of firms.

The tedious myth of "big" firms handling most of the design business in the United States is exposed, as it is every year, by the percentage comparisons of work as reported in the Survey. Firms doing over $50,000,000 business in 1960 will represent only 1.1% of those reporting, and offices with more than 100 employes will account for only 1.2% of the total. Both of these, incidentally, are only slight declines from the 1959 Survey.

The number of firms specializing in one particular design field shows a slight decline in the 1960 Survey. The areas of specialization, however, remain approximately the same; with the Education, Commerce, Single Residential, and Religion categories as the top four.

Despite the regions which report less business for 1960, and design categories such as Industry and Public Use which will be less active, the over-all architectural business picture emerges as an active, rising, healthy one. The profession can look forward to a profitable year in 1960 if miasmas of another recession are not induced by current labor troubles in the steel industry.

Photo: Ezra Stoller

GUGGENHEIM MUSEUM HOLDS LONG-AWAITED OPENING

NEW YORK, N. Y.—Crowds of curious New Yorkers are streaming into the Solomon R. Guggenheim Museum (pages 75-77, JULY 1959 P/A) here to see "what it's like on the inside." Sensation-seekers are not disappointed, for the sight of Klee, Kandinsky, and deKooning marching up (or down) Frank Lloyd Wright's ramp ranks among the unique architectural experiences of our time.

According to Harry Frank Guggenheim, "Mr. Wright's plan for the display and lighting of paintings was not acceptable to the Trustees, but the architect's aim, namely that the paintings would appear to be floating in space . . . happily has been achieved." The paintings are mounted on metal rods which project from the slanted walls of the ramp (*above*), so that they indeed float in air.

Lighting was designed by Director James Johnson Sweeney and American Lighting Corporation. They were successful in creating, together with natural light, a pure, cold light appropriate for showing contemporary art.

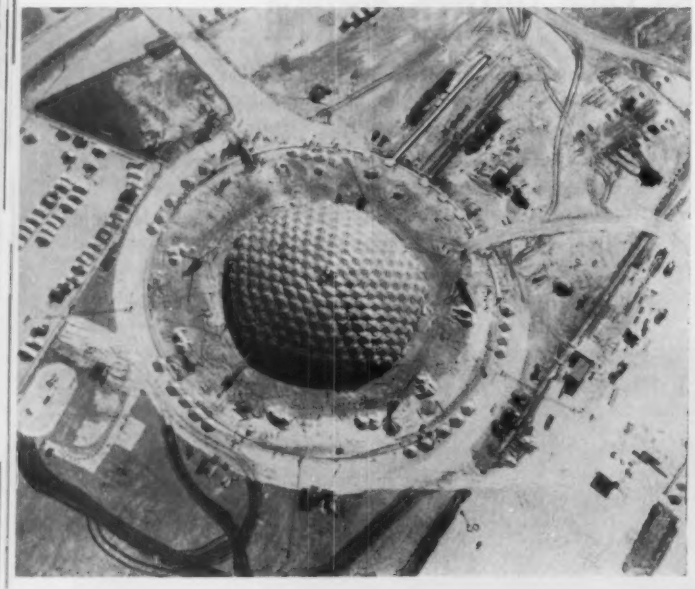
Photo: Alexandre Georges

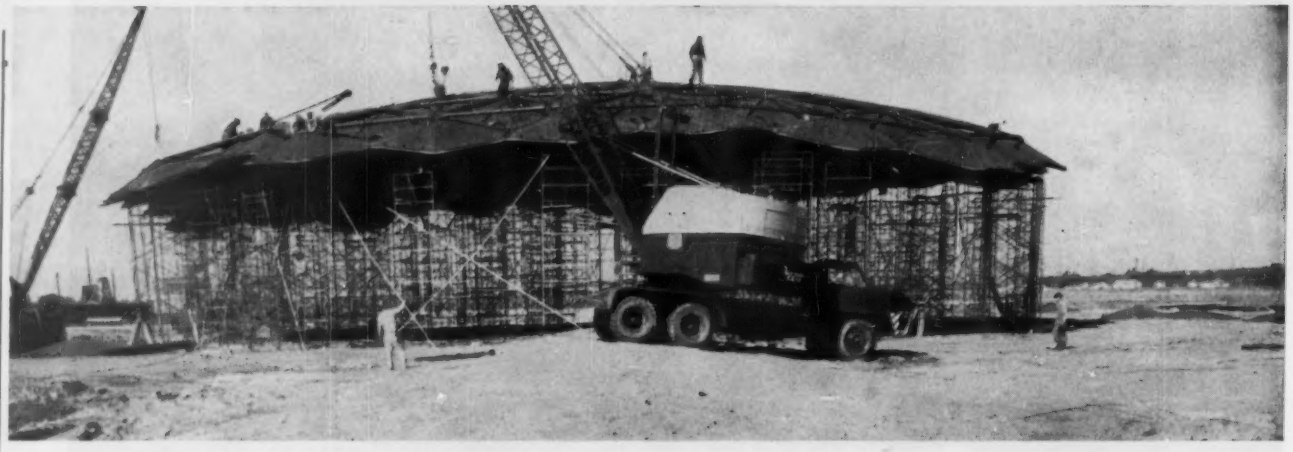
EXPANDING PLASTIC AIRRHOID BOOSTS WOOD RIVER DOME

All-Welded Steel Structure Built From Top Down

For its parent company's second 380'-diameter geodesic-dome structure to serve as a tank car repair and maintenance plant, Graver Tank and Manufacturing Company —division of Union Tank Car Company, Chicago—has successfully erected a 120'-high structure at Wood River, Illinois, from the top down by means of a huge, air-inflated expanding pneumatic diaphragm. The diaphragm—or bag —is made of 1/32"-thick vinyl-coated nylon consisting of 20 gores, including 10 top gores (approximately 100' long and 95' wide) and 10 bottom gores (approximately 100' long and 100' wide). Construction of the dome began by welding together 220 hexagonal panels to form the topmost section of the structure. Measuring about 175' across, this section was erected on a scaffold 30' high at its center. At this diameter, 40 hydraulic jacks were placed in a circle beneath the outer overhanging panels. These jacks were raised, to relieve the scaffold of the weight of the dome, and the scaffolding removed. The bag was then attached to the underside of the dome shell, inside the circle of jacks. Air was delivered to the bag through an underground tunnel to an outlet at the center of the floor, so that the bag formed a seal or wall between the partial dome and the ground beneath. Both hydraulic jacks and guy lines were used to stabilize the dome during construction, preventing it from slipping in any direction. Supporting from 10 to 25 percent of the dome's weight, the jacks were moved outward under the outer row of panels with each lifting operation. Guy lines were attached to 120 points around the dome and anchored to 10 buried concrete deadmen spaced 36 degrees apart on a 306' radius. The bag, itself, was restrained and reinforced by 320 ropes (32 per gore) each $\frac{5}{8}$" diameter. These ropes were extended downward around the outside of the bag and anchored to two holding rings at ground level

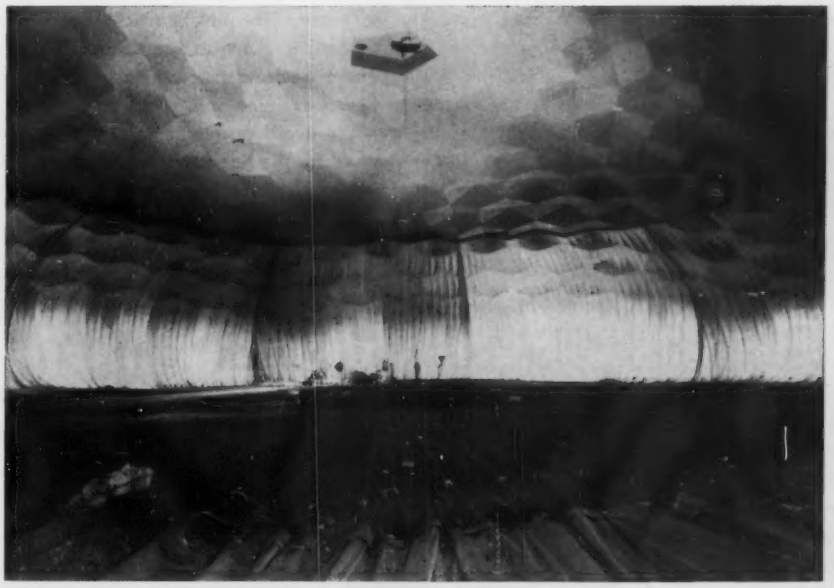
[1]*First Union Dome was erected at Baton Rouge, La.; see* NOVEMBER 1958 P/A.





and inside the dome at its center. The diaphragm was inflated by two blowers, each powered by a 25-hp, 440-v motor. Once the bag was filled with air, one blower was run continuously and the other used as a standby. The blowers were alternated, one being used as the main blower one day and changed to auxiliary status the next. Air was forced through the tunnel at the rate of 20,000 cu ft per min. To maintain the air pressure and elevation of the dome at desired levels, a simple manual vent was located at the top center of the dome. This vent, operated by a pulley-and-cable arrangement, functioned like the damper of a furnace—opening when it was desirable to permit air to escape, or closing to contain the air. If a build-up of pressure caused the dome to be lifted beyond the desired elevation, the cable became taut and opened the vent, allowing air to escape until the dome settled back to the selected level. If air pressure fell below the prescribed level, the settling of the dome caused the vent to close and contain air until pressure was again built up. Air pressure of 1.45 oz per sq in. was required to support the dome weight at any desired level, while 1.60 oz per sq in. of pressure was required to raise the dome to a new elevation. Preparatory to a lift, the cable to the vent was slackened by the number of feet needed for the lift, thereby closing the vent and containing the air until the elevation was attained. Twenty-six lifting operations were conducted, averaging approximately 1½ lifts for each of the 18 rows of panels on the completed structure. After each lift, additional panels were welded to the perimeter of the dome until it was completed to its 380' diameter. Guy wires were loosened to allow sufficient freedom of dome movement for the lift. The shell began to lift when air pressure inside reached 1.60 oz per sq in., rising at the rate of approximately 1" every 30 seconds. The dome sought a level where the amount of air entering the bag from the blower was equal to the amount of air escaping from the vent.

In the final operation, the dome was welded to the foundation ring. Total surface area of the panels is 154,900 sq ft; total weight above foundations amounted to 560 tons. Construction called for only three basic components: the hexagonal panels, 6" steel pipe used to interlock vertices of adjoining panels, and hemispherical-strut landing units used to anchor base pipes. With this erection method, a significant savings in the rental of cranes and cost of operating crews was immediately realized.



CURTAIN-WALL RESEARCH DEVELOPS IMPROVED PROGRAM AND SERVICES

NILES, MICH.—A major building-material producer has employed exhaustive research to clear up some of the confusion about selection of curtain walls and to guide the architectural profession and its distributors, toward suitable types and requisite conditions for installations.

Officials of Kawneer Company were aware of the somewhat chaotic situation in curtain-wall construction. Rumblings of discontent regarding the end product or completed structures have been heard from many sources over the recent years of curtain-wall evolution. The criticism was directed at unacceptable final performance and at either excessively monotonous or "flat" appearances. Equally important to Kawneer in making the survey was a determination of its own place in the production of curtain walls, as it related to design and erection responsibilities normally assigned to others. The company also wanted to learn how best to provide needed service and accurate information to designers, distributors, and contractors.

The construction market and prevailing conditions were examined to find out what architectural firms' experience had been with curtain walls and to help find an answer to the problems of designing attractive and useful buildings that would perform satisfactorily. The purposes of the study were: to obtain data which could be incorporated in the creative materials needed; to define the market and outline sales-training requirements and the type of sales tools needed; and to develop a profile of the type of representation required. Interviews were conducted in widely separate geographical locations among architects, owners, contractors, sales agents, and even competitors. As a result of the investigation, Kawneer acted to improve its services and products, with attention to gasketing and weather tightness, as well as appearance. The line was broadened to include four categories of products or systems filling every requirement from those of small specialized buildings to multistory structures. A "recommended contractor" for wall systems was projected in profile and the company's own list of fabricators and distributors was examined to see how well it met the ideal established. Special courses of training were established for company spokesmen. Also, a qualified group of factory representatives was chosen.

In the training program that followed, Kawneer set up separate courses for wall-systems salesmen and wall-systems contractors. Among subjects covered were: assistance with budget estimates; preparation of final estimate; negotiation of contracts; indoctrination in products design and adaptation of the systems, and how each works best under different circumstances. Erection problems and how they are best solved at lowest possible cost formed an important part of the course. Storing, gasketing, finishing, weathering, and cleaning were studied and the best methods for each were demonstrated. The point was made that these elements must be co-ordinated to produce an efficient result.

According to the company, "the most critical need in the business is to provide . . . one-source responsibility . . . for the erection and performance of the wall." It was believed important to examine this requirement and detail the solution so as to avoid serious penalties.

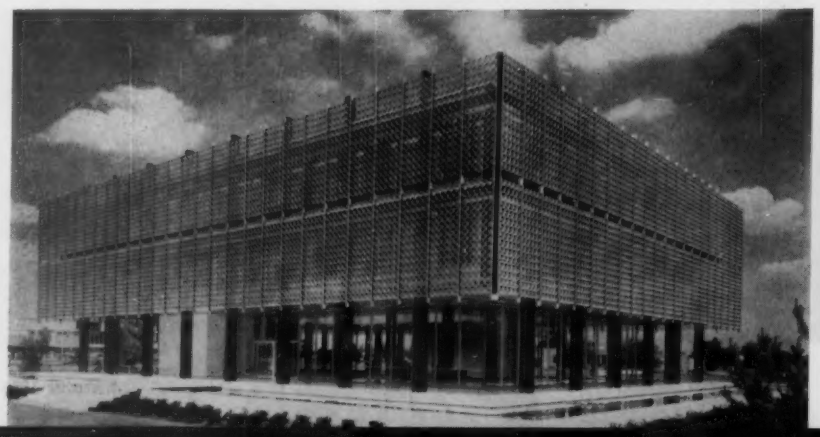
A manual was developed for the Kawneer program, called "A Simple Guide to Wall Systems for Buildings of Every Size and Budget." It gives data on moisture control and other weather conditions, on controlled assembly and erection processes for modern wall systems.

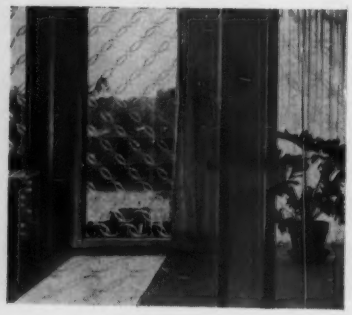
REYNOLDS BUILDING HAS "DISAPPEARING" SCREEN

DETROIT, MICH.—The Great Lakes Sales Region Headquarters of Reynolds Metals Company has opened here, across the way from famed Northland Shopping Center. Designed by Minoru Yamasaki & Associates, the building provides a glittering showcase of the use of aluminum.

Dominant feature of the design is the gold-anodized aluminum screen which envelops the top two floors of the three-floor structure. This screen—conceived by Yamasaki, developed by Reynolds, and fabricated and erected by Moynahan Bronze Company—consists of interlacing rings of ten-in. diameter which are two in. deep at sight line, and 14 in. deep above. It forms a sparkling "advertisement" from outside, but tends to disappear when viewed from inside. As Yamasaki says, ". . . the grill is very transparent from within the building as contrasted to the opacity of masonry grills."

Early in 1960, P/A will feature the Reynolds building in a critical article discussing metal in architecture.





MONTREAL CENTER PLANNED BY PEI

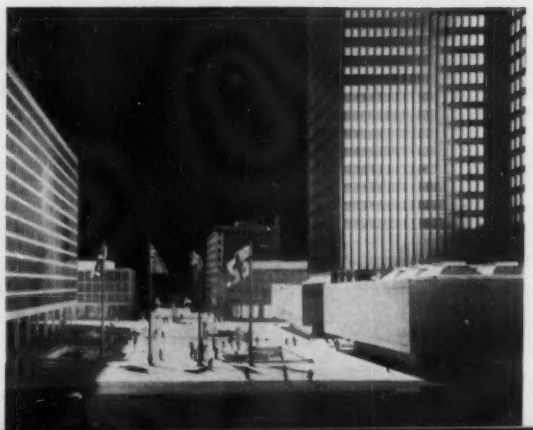
Will Include Canada's Biggest Building

MONTREAL, CANADA—Midway between Mount Royal and the St. Lawrence River, in the heart of this city's business and transportation district, a major urban-redevelopment scheme is on the verge of realization. This is Place Ville-Marie, a 7½-acre commercial center which will include the largest and tallest building in all Canada.

Two blocks which will connect with Place Ville-Marie via underground streets and passageways for pedestrians and vehicles contain railroad station, bus terminal, heliport, and the city's largest convention hotel. A moving walk will run the full length of the three blocks. The entire Ville Marie area will have parking for 5000 cars; Place Ville-Marie itself will have a 1000-car, attended, parking garage beneath the plaza.

The Place, designed by I. M. Pei & Associates for Webb & Knapp (Canada) Ltd., will have four elements: the 40-story, cruciform tower; a long, low bank of shops lining the northern edge of the site; a twelve-story commercial building; and a generous, landscaped plaza which will occupy 60% of the area. The tower and plaza will be arranged to draw the eye into McGill College Avenue (for which widening is proposed), leading to a view of Mount Royal, in the distance. The row of shops will line a mall at the side of the tower, according to initial plans. But most recent designs put stores at the lower level, beneath the plaza. The tower will create approximately 40 acres of office space for downtown Montreal, one acre per floor. Its cruciform shape will provide natural light for all workers; no desk will be more than 40 ft from the window wall.

A more detailed examination of Pei's proposals for Place Ville-Marie is scheduled for February P/A.



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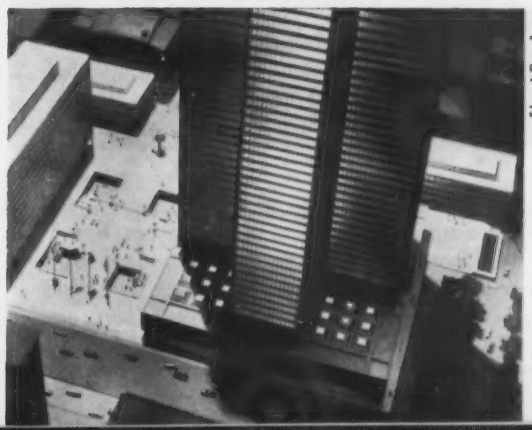


Lionel Freedman

ARCHITECTURAL BULLETINS

● South-facing elevations of library and classroom-administration buildings for Bronx (N. Y.) campus of Hunter College have sun screens of horizontally laid, clay, flue tile. Rectangular buildings, designed by Marcel Breuer &

Associates, achieve harmony with existing Collegiate Gothic buildings through use of same materials and colors: limestone, natural fieldstone, and golden-tan brick. Wide-span, thin-shell, concrete, hyperbolic paraboloids were used to roof library, in order to provide open, flexible space beneath. Interior drama is achieved by leaving concrete shells open to view through aluminum gridwork which supports lights. Robert F. Gatje was associate with Breuer, and Eduardo Catalano was consultant. Structural engineers were Atilio D. Gallo, Buenos Aires, and Farkas & Barron of New York. Chief Architect for Board of Education, Arthur A. Schiller, was supervisor.

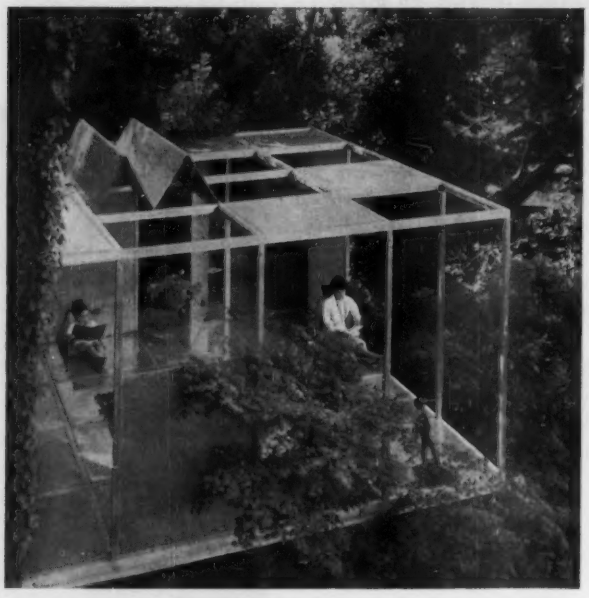
● Rumors of possible destruction of Wright's Imperial Hotel in Tokyo were allayed by word from Harold Price (of Price Tower fame), who returned from Japan with word that hotel's management flatly denies any such scheme.

● Loggia surrounding glass-walled administration building of Philip Morris' O. Parker McComas Research Center, Richmond, Va., recalls traditional architecture of region. Building is connected by glassed-in passage to research building. Precast-concrete panels forming sun screens are

set out from wall of research building by concrete fins; occur slightly above eye level of workers to provide clear view of wooded site. Architect Ulrich Franzen, New York, states that future plans include twin of research building on other side of administration unit. Lower level of latter building contains employe cafeteria that looks out on dining court. Engineer was H. J. Ferguson Company, Inc., Cleveland.

● Five universities are participating in financial aid program for architectural students and schools of architecture provided by Allied Chemical's Barrett Division, according to division president H. Dorn Stewart. Plan provides annual sum of $1000 to each university, $650 to be given to one or more students at discretion of school's scholarship committee, and $350 to be used in any phase of school's architectural program.

● Latest in Alcoa's "Forecast" collection of inventive designs using aluminum is this "view box" designed by Califor-



nian John Matthias. Introduced at San Francisco Home Show, structure is assembled from structural-aluminum channels, slide-in joints, and panels of aluminum or other materials. It can be erected and dismantled easily; and moved around at will, "like a tent." Possible uses: garden, play, or guest house; beach cottage; tea house for restaurant; lodge; etc. Structure sits on stilts adjustable to six-ft variations in height — thus may be set level on a slope.

● Association of New York and New Jersey architects and engineers was responsible, with Navy technicians, for design of world's largest radio telescope, now under construction near Sugar Grove, W. Va. Designers are Grad, Urbahn & Seelye, comprising firms of Frank Grad & Sons, Newark, N.J., architects-engineers; Urbahn, Brayton & Barrows, New York architects; and Seelye, Stevenson, Value & Knecht, New York consulting engineers. Radio telescope will have saucer-shaped antenna 600 ft in diameter (largest now in operation is 250-ft radio telescope in England; Soviets are reportedly constructing a 350-ft radio telescope). Telescope theoretically will be able to reach into space 38 billion light years, conceivably exceeding size of the universe.

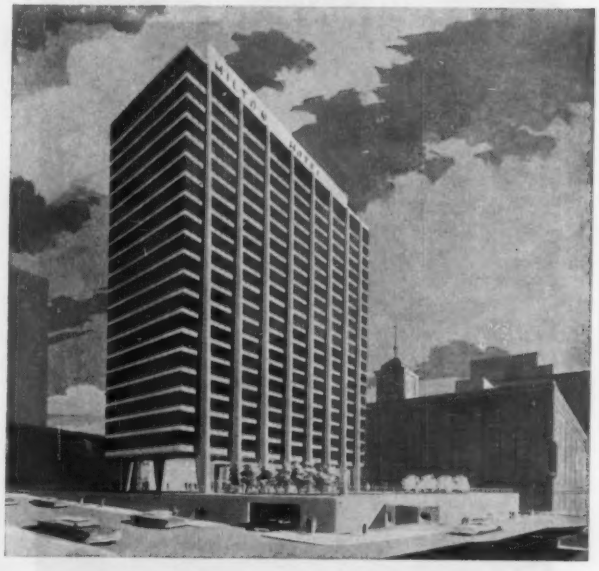
This is 19 times greater than the range of the 200-in. optical telescope atop Mount Palomar, Calif.

● Latest proposal for New York's Lincoln Center for Performing Arts is park for outdoor performances, to be named after famed Damrosch music family. Park, which will be adjacent to Metropolitan Opera and Theater for Dance, will have bandshell, is being designed by Eggers & Higgins, New York.

● Entire north wall of University of Nevada Library, Reno, can be unbolted in future to allow for expansion. Ends of folded-plate, concrete roof will be sheathed in silver mosaic. Roof will span 90 ft with 25-ft cantilever at each end, creating great room on top floor. South wall's limestone screen and brick end walls echo materials of other campus buildings. Working drawings are being completed this month by Robert E. Alexander & Associates, Los Angeles. Resident Reno Architects are Vhay Associates.

● Deadline for entry in 1959 "Design in Hardwoods" Awards is Dec. 1. Inquire: Fine Hardwoods Assn., Room 1730, 666 Lakeshore Dr., Chicago 11, Ill. . . . Apply for 1959-60 Rome Prize Fellowships by Dec. 31. Address: Miss Mary T. Williams, American Academy in Rome, 101 Park Ave., New York 17.

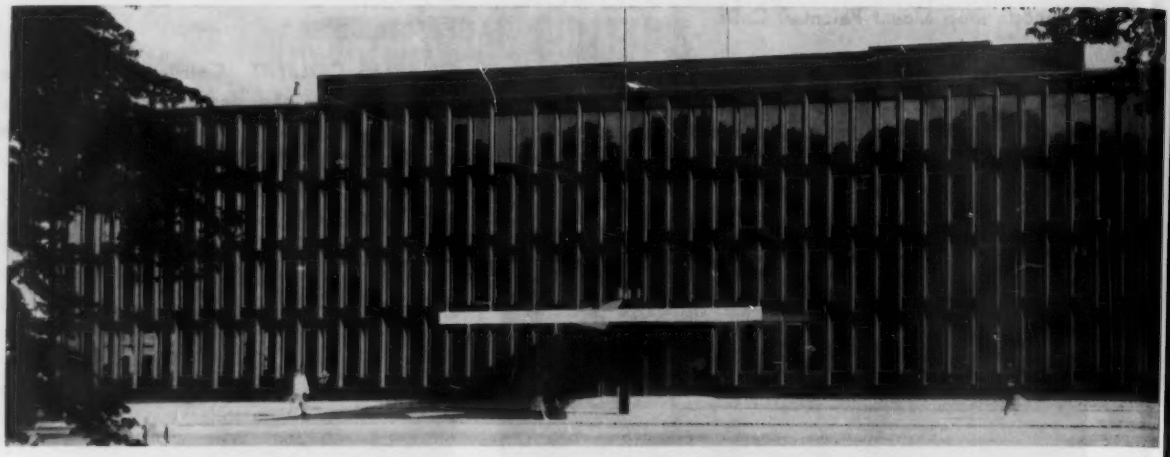
● Conrad Hilton continues to emulate the famous paint in his attempt to "cover the earth." Skidmore, Owings & Merrill are authors of the latest: Portland (Ore.) Hilton. Hotel tower will rise 21 stories from 4-story base which will include public areas and large landscaped plaza. Building, to be Oregon's biggest, will have rooftop dining room seating 200.



Personalities

CHARLES COLBERT (Colbert & Lowrey, New Orleans), speaking on motel design at New York's Architectural League: "When I started tending from school design to motel design, my wife consoled me, saying, 'That's OK, darling, in schools they just educate them; in motels, they make them.' " . . . . *EARL W. HAMPTON* is new Deputy Chief, Architecture & Engineering, of California, according to State Architect *ANSON BOYD*. He will be aided by *ARTHUR F. DUDMAN*, in charge of design and planning in north, and *TOM MERET*, in charge of design and planning in south . . . . *LO-YI CHAN*, San Antonio, received Harvard's Appleton Fellowship in Architecture for 1959-60; he will use it for travel and study in Japan and other points in Orient . . . . *CRAIG ELLWOOD*, Los Angeles, will conduct advanced design problem at Yale for six weeks beginning Nov. 9 . . . . Graffito covering wall

of main dining room at Quincy House, Harvard, was completed in one day by *COSTANTINO NIVOLA* aided by son, *PETER*. Hall also contains large wall sculpture by Nivola . . . . *WILLIAM GILLETT*, vice-president, Fenestra, Inc., and *RICHARD H. TATLOW III*, president, Abbott, Merkt & Company, have been reappointed chairman and vice-chairman, respectively, of Building Research Advisory Board . . . . Former Federal Highway Administrator *JOHN A. VOLPE*'s nomination for president of Associated General Contractors was approved by association's governing and advisory boards . . . California Council of AIA presented its Distinguished Service Citation to Santa Clara Architect *L. F. RICHARDS*, *Sunset* Publisher *LAURENCE W. LANE*, and *Arts & Architecture* Editor and Publisher *JOHN D. ENTENZA*, during its recent Honolulu convention . . . . Mackinac Bridge, Mich., designed by *DR. D. B. STEINMAN*, won top award in annual competition for good bridge design conducted by American Institute of Steel Construction . . . . *BERNARD BERENSON*, renowned expert on art of Italian Renaissance, died at his villa near Florence, Oct. 6 . . . . *JOHN E. DINWIDDIE*, dean of Tulane University's school of architecture, died Oct. 11, after a short illness . . . . *JOHN MEAD HOWELLS*, designer with Raymond Hood of Chicago's Tribune Tower and New York's Daily News Building, died Sept. 22. He was author of several books on history of architecture.



EXCITING EMBASSY BY SAARINEN OPENS UNDER FIRE

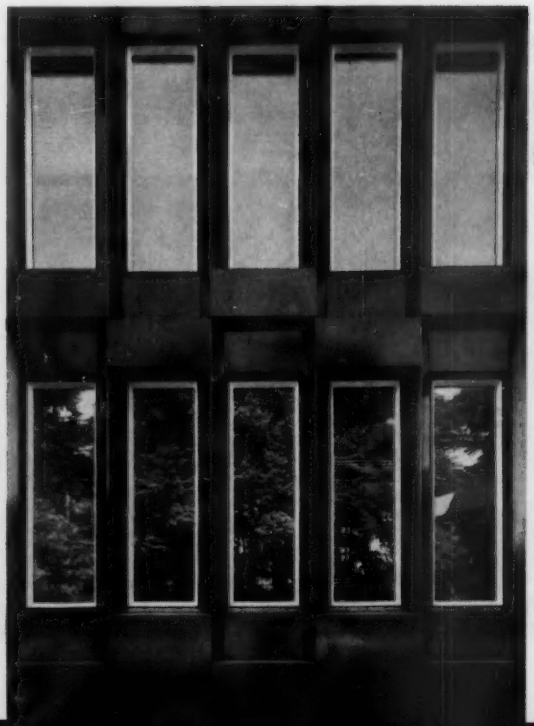
Gracious Court Is Building's Heart

OSLO, NORWAY—Eero Saarinen's U. S. Embassy Building for Oslo—which, with his London Embassy, was the target of vicious attacks by Rep. Wayne L. Hays, Chairman of House Subcommittee on State Department Organization and Foreign Operations—has opened, and the results proclaim the irresponsibility of the Congressman's statements. (Hays had threatened to withhold all funds from the Foreign Buildings Office of State Department if FBO's "pet architect," Saarinen, ever got another job.)

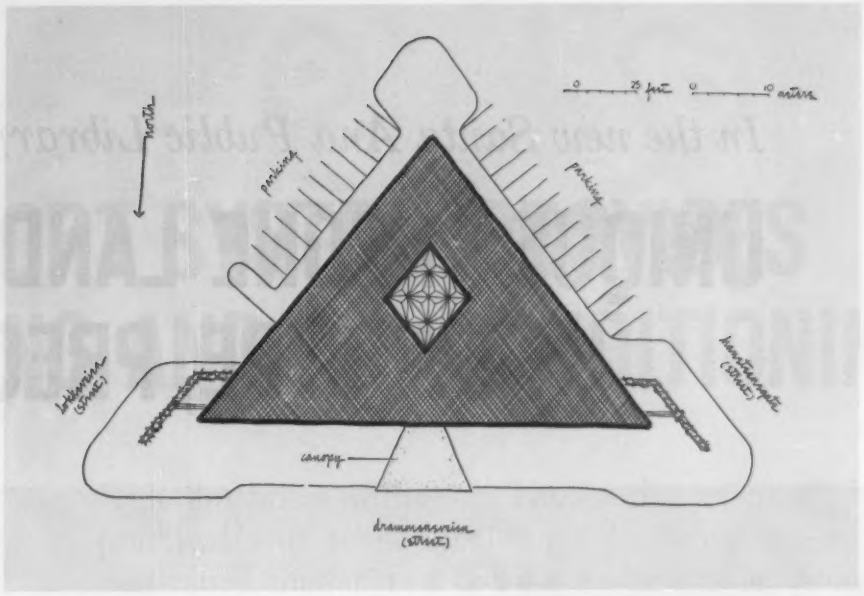
According to Saarinen, the Oslo Embassy was conceived "as a triangular Renaissance palace, with rooms surrounding a court." The shape of the building was dictated by the fact that it is on a lot bounded on three sides by streets *(acrosspage, top)*. Located across from the Royal Palace, the Embassy meets the scale of old buildings on the Drammansviein, one of Oslo's major streets.

A new Norwegian industry was started for the production of the precast elements which form the façade of the Embassy. The Saarinen office created a precast unit with an integral surface consisting of about 90% Norwegian Emerald Pearl Granite, polished. Saarinen states that the granite has a lustrous, dark-green color which provides "a changing sheen and a vitality which are uncommon in precast walls." The passerby is treated to a surface changing between mat and shiny, dark and light surfaces.

Because of the long, cold, dark months in Norway, the great reception court of the building *(acrosspage, bottom)* is enclosed and skylighted. A feeling of inviting warmth was achieved through use of warm-hued and textured materials: vertical fins of teak rising the height of the court; a beige, Roman travertine floor; and an elegantly simple brick grill on the walls facing the teak screens. Warm light-



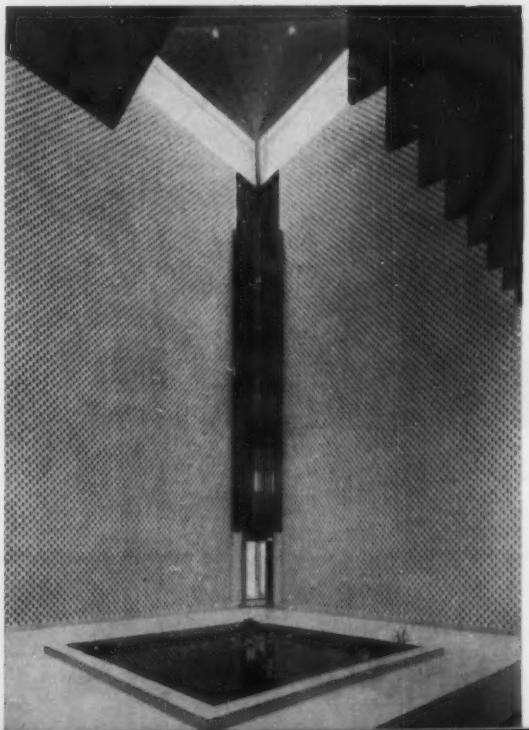
Photos: Fotograf Teigen



ing in the court adds to the feeling of hospitality. The court's diamond shape reflects the triangular plan of the building. A pool in the center was to have a 15-ft-high sculpture to emphasize the volume of the space. Saarinen still hopes this can be added.

At either end of the Drammansviein façade of the Embassy are entrances to serve major functions: the U.S. Information Service and the consular section. Administrative and consular activities take place on the ground floor; the USIS Library is on the second floor. When lighted, it is an invitation to enter and use its services. The third floor is planned for the economic and military sections, and the top floor holds the Ambassador's quarters, political section, and security departments.

Associate architects were Engh, Quam & Kiaer. John Engh and Henrik Kiaer supervised construction.



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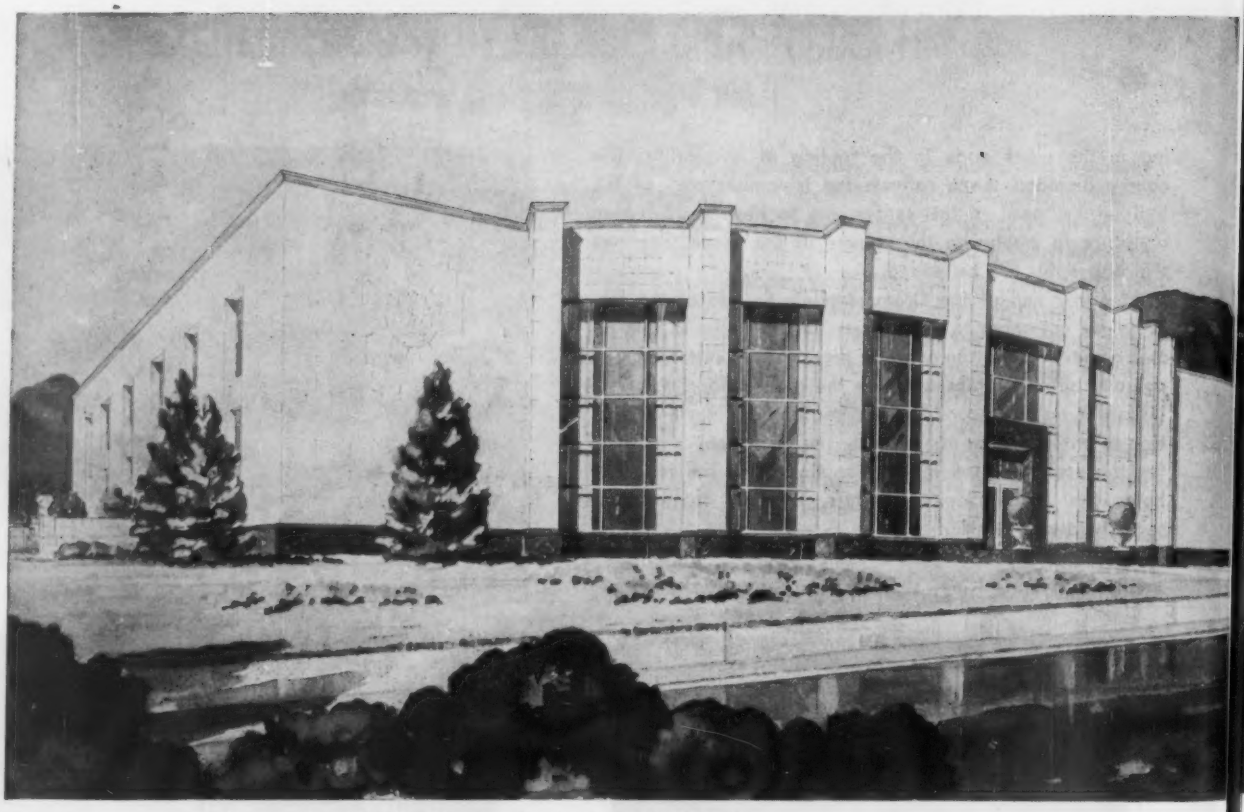

Santa Ana Public Library, Santa Ana, California
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Harold Gimeno, A.I.A.	Architect
Lee Fabian	Project Architect
Al Visioni	Project Engineer
Francis Keally & Harold S. Patterson, Associated Architects	Library Consultants

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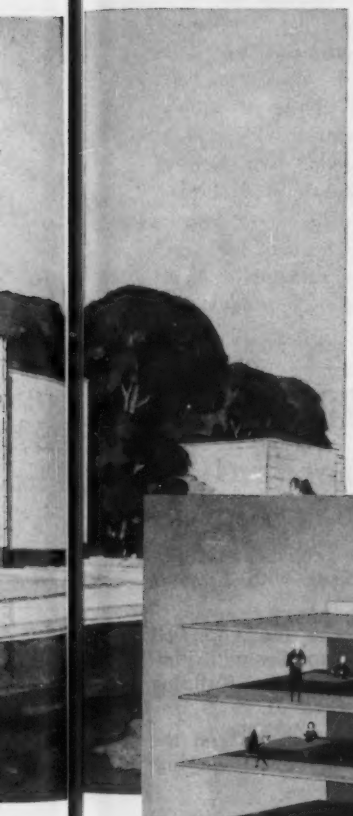

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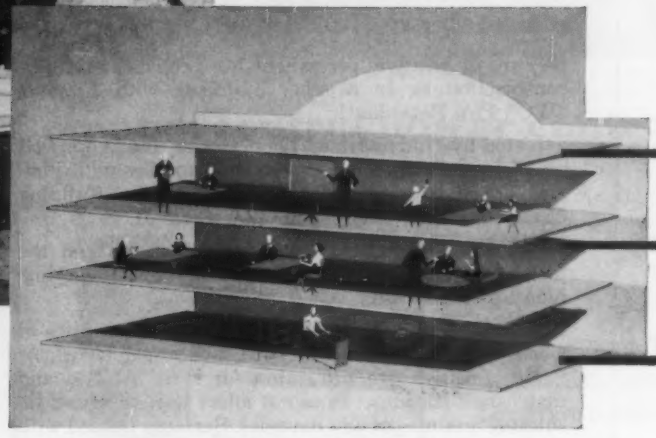

2nd floor—three zones
Three Landmarks cover 10,000 sq. ft.—reading rooms, offices, club rooms

1st floor—six zones
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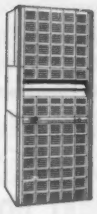
Basement—two zones
Two Landmarks (heating only) cover 14,000 sq. ft.—storage



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CONSTRUCTION REFLECTS ECONOMIC ATTITUDES OF ADMINISTRATION

by Frederick Gutheim

If the steel strike were not sufficient excuse for some reflections on the national economy, the continued relatively low production of schools, hospitals, and even housing in these prosperous days would justify such thoughts. Nor are the two questions altogether unrelated: as this column will suggest. Recent hearings before Joint Committee on the Economic Report, a body which has become the closest thing to an economic-planning agency that Congress has developed, indicate that more will be heard on this subject when the legislative branch returns in January. That Committee has explored the extent to which the interest-rate ceiling of 4¼% now imposed by Congress on Treasury-bond issues is affecting capital outlay for schools, hospitals, and other public-building types. Others in Congress have made clear their concern with a related question: the disproportionately high share of the total Federal, state, and local budget that is represented by highways to the disadvantage of other types of public construction.

These questions are not unrelated to the inflation issue which President Eisenhower made the basis for his impressive defense of the Federal budget earlier this year. The long and complicated struggle on the housing program revealed this as the central question in the mind of the White House—where institutional thinking is done by the President's Council of Economic Advisers. It has been the opinion of this influential body that building output was already so high that any increase in appropriations or lending would lead not to additional building, but merely to higher prices. This question simply raises others: by what means, and how rapidly building output can be increased. At bottom, we are dealing with investment trends, especially as these are influenced by monetary and fiscal policy.

The investment needs of schools, hospitals, and urban renewal must compete with the attractions offered by new and rapidly developing industries which are characterized by high profits. More recently, it has been pointed out that high profits also characterize other industries with market power, like the steel and automobile industries. Into these industries has gone much of our recent investment. Has this been necessary to increase production? Are these the essential activities for our economy? These are the questions of public policy to which the Joint Committee has been attracted. Economists testifying before the Committee have pointed out that by no means all of the large postwar plant- and equipment-expansion programs are investments in greater productivity. Nor are they needed for reasons of technological progress (that form of accelerated obsolescence which some industries are calling "creative destruction"). Such investment has, for example, financed the recent reduction in the new design cycle for automobiles, from four years to two—a *dubious* contribution to productivity.

(Continued on page 96)

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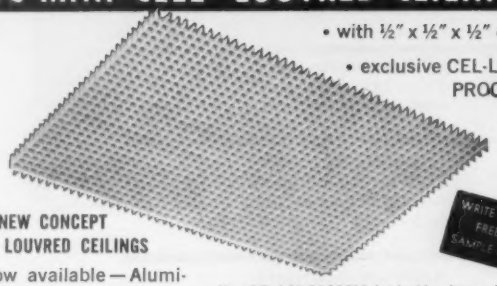

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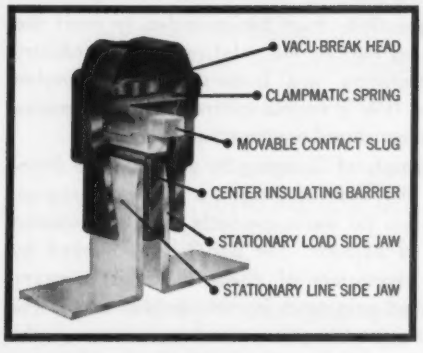

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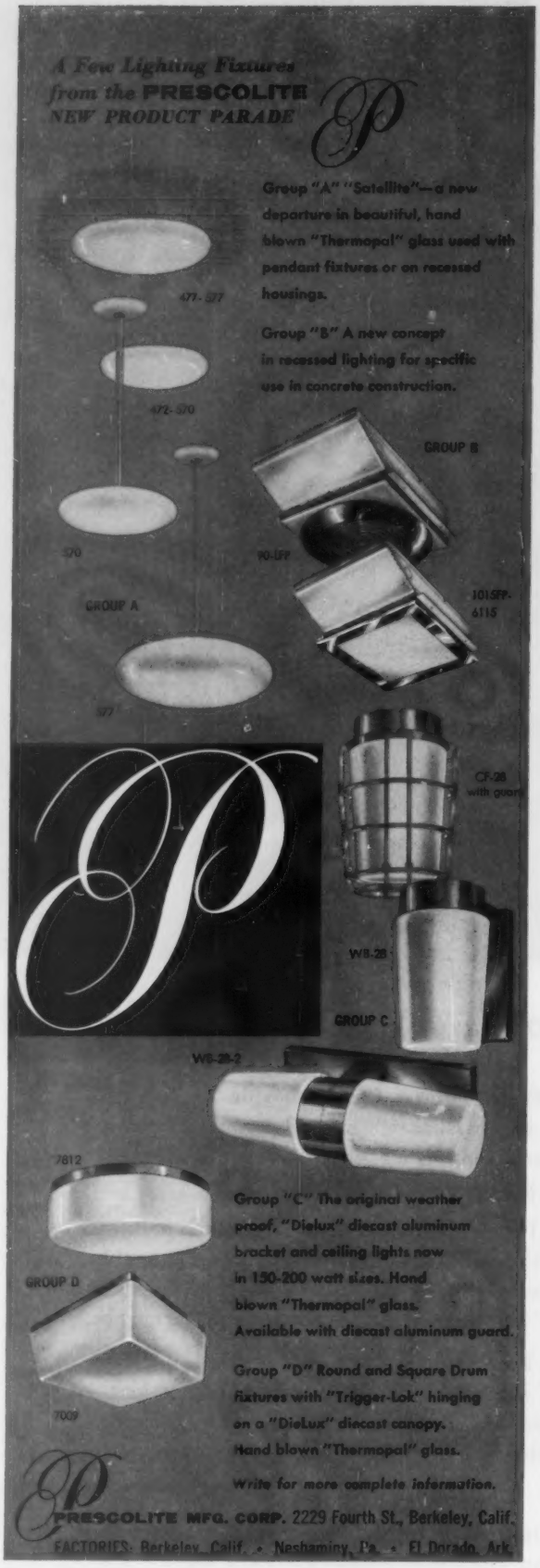
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p/a news report: **Washington**

(Continued from page 94)

The command of investment capital rather than real economic need has been suggested as the factor supporting such management practices. Perhaps the question to consider is whether retained corporate earnings are responsible for corporative-investment outlays which reflect neither strong expansionary forces in the economy, nor a demand for increased productive capacity.

The distortion in investment, by over-concentration in certain industries to the disadvantage of the public sector of the economy, has been accentuated by the artificial ceiling on Treasury-bond interest rates. This affects not only primary-building activities, but also the construction industry itself. To quote Prof. John R. Meyer of Harvard University, one of the most far-seeing witnesses before the Joint Committee, "A stringent monetary policy may have a lagged influence because of the eventual backing up of reduced activity, induced by tight money, in other sectors of the economy. For example, if—as seems highly probable—the main effect of tight money is to reduce housing starts, public investments, and small-business investments; then the large-steel, consumer-durable, lumber, and building-equipment corporations serving the housing, public-construction and other interest-sensitive or affected sectors, will eventually have a reduction in their own sales and an accompanying reduction in their profits which will eventually retard their investment outlays."

The importance of these questions, of course, is that we now live in a time when a substantial degree of management of the economy is being practiced. This is neither extensive nor absolute in its control of economic stability; although it is sufficient to prevent any depression worse than, let us say, those of 1949, 1953, or 1957. As we learn more about the effect of public policies—what policies to apply, when to apply them, and how long they require to take effect—still greater stability should be possible without such corresponding interference with a free economy as would accompany price controls and other gross devices of a managed economy. Considering how central these questions are to the building industry, and how fundamentally the building activity must be expanded to meet the needs of a growing nation; the relative lack of industry organization, articulation, and leadership in Washington compels attention. It is a curious contrast to the intensive lobbying activity on direct-construction programs.

The frantic attempts of Congress to patch up the financial structure of the Federal interstate highway program by increasing the gas tax was a spectacle largely concealed in the scramble to adjourn. The debate was marked by some significant expressions of *doubt* that this program, much of whose need originates in metropolitan areas, and whose cost (if not also mileage) is concentrated there, is the high-priority public need and the unmixed urban blessing it has been represented. More and more legislators are aware that the absolute fiscal limits of states and localities allow them to participate in the highway program—even when nine Federal dollars match but one local dollar—only by sacrificing other compelling local-government needs. A searching second look at this program is certainly in the cards next year.

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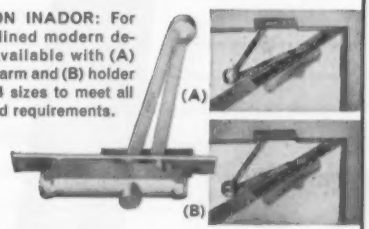

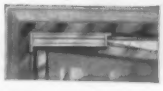

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Specify Yoloy (nickel-copper low alloy) steel conduit to handle applications where greater strength, corrosion-resistance, and weldability are required.

Yoloy Conduit should be specified for electrical installations where corrosion is expected to be more severe than normal. Research has proved Yoloy resists corrosion 4 times longer than carbon steel in marine and industrial atmospheres.

Yoloy steels have proved highly resistant to corrosion in oil fields, coal mines, railroad cars, motor trucks and highway construction equipment for over a quarter-century. Long-time tests and actual installations have proved that Yoloy pipe lowers costs when used for salt water lines, oil wells, industrial installations and corrosive soils.

Corrosion studies conducted for 14 years in 13 different soils show that Yoloy has 19% less pitting and 36% less weight loss than carbon steel—and 10% less pitting and 23% less weight loss than wrought iron. This proved corrosion resistance greatly lengthens the life of coatings—galvanized or enameled—on Yoloy Conduit.

Check with your Youngstown Representative and get the complete story on how Yoloy Conduit and E.M.T. can easily meet your most exacting job specifications.

The Youngstown Sheet and Tube Company, Youngstown, O. Carbon, Alloy and Yoloy Steel.

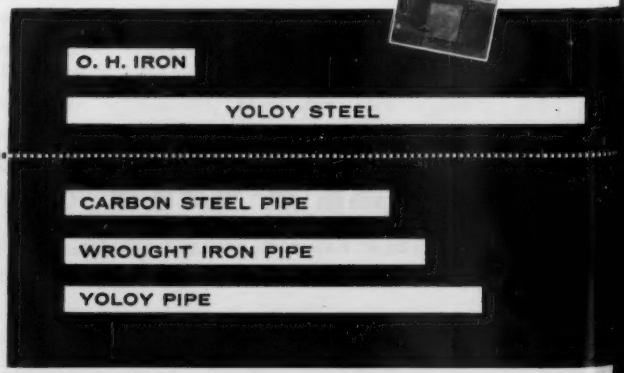
Send for free technical bulletin on Youngstown Yoloy Conduit and E.M.T.

QUALITY YOUNGSTOWN SERVICE

Youngstown

Atmospheric corrosion tests held off the coast of New Jersey revealed Yoloy steel will last four times longer than open-hearth iron.

Expected life increase of Yoloy steel over carbon and wrought iron in corrosive soils. Studies were conducted over a 14-year period in 13 different soils.



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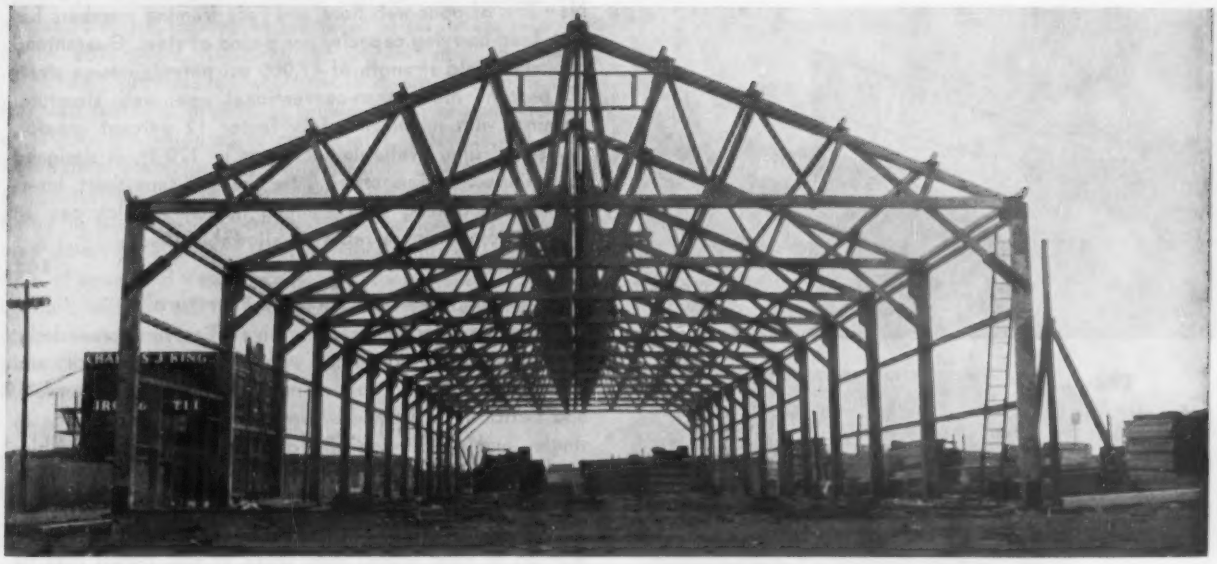


TIMBER IS FIREPROOFED BY PRESSURE-TREATING PROCESS

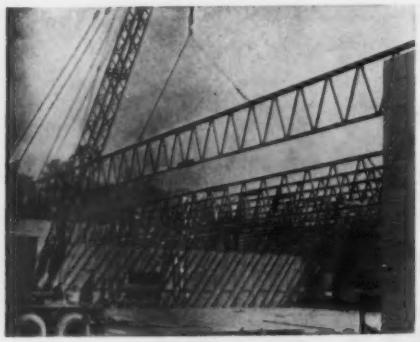
Treated Wood Retains Strength After Fire

NEW YORK, N. Y.—Recent changes in building codes here —codes which frequently influence those in other cities— have allowed the construction of Class 5 commercial buildings (one-story with maximum 15,000 sq ft floor space) with wood framing if the timbers are "fireproofed."

The process which has made possible use of treated wood as structure of these buildings consists of "vacuum-pressure impregnation with a special combination of fire retardant ammonium and boron salts complying with Federal Specifications for fire retardants (Type 2)." In the process, wood is introduced into a horizontal steel cylinder six ft in diameter by 75 ft long (*below*). A vacuum is created in the cylinder to de-aerate the wood. The cylinder is then filled with the heated treating solution; pumping with additional solution builds pressure to 50 to 250 psi, depending on the hardness of the wood being treated. The length of time the wood is kept under treatment also depends on its species. The average time is from 12 to 14 hours. When treatment is complete, timber is air-seasoned on sticks in the yard before shipment. Treated wood reportedly will not support combustion, and retains its bearing strength through fires of 1300 F and over.

The building whose framing is shown here was constructed in New York, and cladded with aluminum sheathing from the Aluminum Company of America.

Cross, Austin Lumber Treating Corporation **100**



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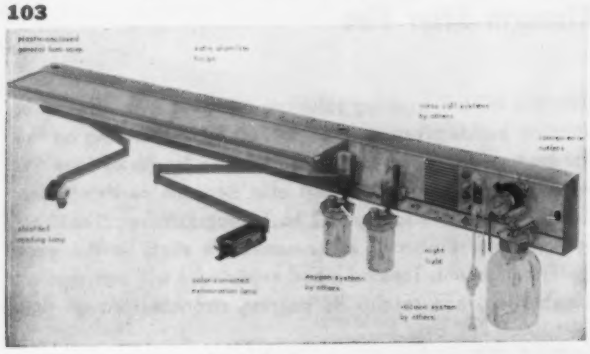

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Open-Web Structurals Have High Capacity

New line of open-web floor and roof framing members has high load-carrying capacity per pound of steel. Guaranteed minimum yield strength of 47,000 psi permits design stress 25 percent higher-than-conventional open-web structural framing, with minimum safety factor 12 percent greater. "Allspan" line, available for spans to 120 ft, is designed to one specification, offering for the first time short, intermediate, and long span framing members which can be chosen from a single table of allowable loads.
Macomber Inc. **101**

Flexibility Marks Executive Furniture

Group Nine, new line of executive-office furniture—desks, tables, cabinets, of walnut with a natural-oil finish, and chairs—was planned for warmth of appearance, comfort, and flexibility in individual arrangements. Wide choice of single- and double-pedestal desks and conference tables (four top sizes range from 60" to 90"), executive cabinets, and side units is offered. For design variation, desk and table tops may also be surfaced with plastic laminates, leather, or vinyl fabric; knee space or side panels may be in matching leather or vinyl. Other special design features are the desk's recessed, cube-shaped drawer cases; turned wooden legs (or a solid-aluminum leg base) on large, adjustable, aluminum glides; all drawer bottoms faced with white plastic; drawer pulls of black cast-aluminum on an elliptical aluminum shield (or shaped walnut pull).
Jens Risom Design, Inc. **102**

Unit Integrates Patient Services

Hospital-bedroom console unit integrates ten different services normally installed separately. Contained in one package are a general illumination unit, shielded reading light, color-corrected examination light, night lights, convenience outlets, provision for audio-visual nurse call system, oxygen and vacuum systems, television lead-ins, phone outlets, and accessory intravenous apparatus support arm. Already pre-wired, "Centron-10" co-ordinates all functions in one centralized location, permits "feed thru" of all plumbing and electrical services for four beds into two adjoining rooms. Labor costs for installation claim $32.50 per bed saving over ordinary separate facilities.
Sunbeam Lighting Company **103**

Steel Furniture Has Design Advantages

The Doric line of office furniture, desks and auxiliary storage units, is notable for design simplicity. Variety of materials, colors, and surfaces in modular components offers flexibility in planning office interiors. Double and single pedestal desks have standard tops of steel core and plastic laminate finish in a range of sizes; marble or wood tops may be specified. Standard Doric colors are black, cordovan, blue, and sandstone—though custom colors on orders of 10 or more units are available. Standard stainless-steel frames and chrome hardware are brushed finish.
Corry Jamestown Corporation **104**

Plastic Insert Closes Door Quietly

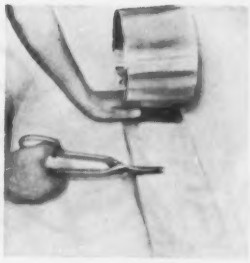
Silent door latches are achieved by using sound-absorbing materials in mortise cylinder locksets. Metal-to-metal sounds are minimized by special Phenolic plastic insert in the latch bolt. Suggested uses for hardware are radio and TV studios, hospitals, and offices.
P. & F. Corbin Division **105**

Ribbon Metal Tubing Is Inflatable

Light-wall seamless-metal tubing that can be shipped in ribbon form and inflated at the point of use offers several major advantages. Cold-rolling process used to make "Strubing" provides an economical means of producing thin-wall tubing in thicknesses previously either unavailable or prohibitive. Shipping of coil lengths is economical and installation is simple—ribbon for heating ductwork, for instance, could be strung through an entire house, then inflated in place. Other potential construction uses include inner liners for pipe or tank (particularly in repair operations of sewer and water mains), downspouts, and electrical conduit. Inflation can be by hydraulic pressure, air pressure, or mechanical means, with wall thickness determining the pressure required.

Calumet & Hecla, Inc. **106**

106



Lighting Fixtures Plug In Like Appliances

Unique lighting fixtures plug into branch circuit like electric appliances, needing no permanently-wired connection between fixture and branch circuit. Result is unusual flexibility—fixtures can be removed, replaced, or respaced without tools. Light, rigid "Uni-Race," made of telescoping sections screwed together, is bolted to bar joist; "Ortho-77" fixtures are automatically locked into receptacles in perfect alignment. If supported every 24 ft, Uni-Race can be hung in lengths up to 200 ft.

Gibson Manufacturing Company **107**

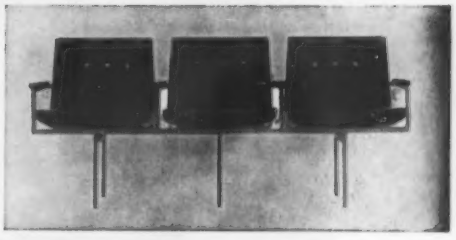
107

Contract Furniture Is Modular

"Modalum" series of walnut tables and seating pieces (single chair, multiple seaters, bench, lounge chair, shoe-fitting stools) was designed for reception rooms, small auditoriums, shoe departments, etc. Modular base structure of ⅞" square extruded aluminum is light in scale, open for easy maintenance. Seating, with foam rubber upholstery and walnut arm rests, is available in standard units of one to four seats; single rows of any desired number of seats may be custom-ordered. Multiple seating units may be varied by replacing seat with a walnut table-and-drawer unit; or combined with corner table mounted between right angle rows.

Kasparians **108**

108

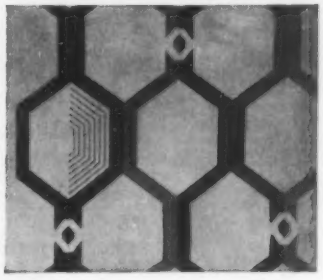


Fabric Collection Has Variety of Designs

"Contempora" aptly names new collection of contemporary designs, hand-printed on a variety of fabrics—Saranspun, Fiberglas Aerocor, linen, and cotton duck. "Crystal" is printed on 50"-wide Saranspun, a durable, abrasion- and fire-resistant fabric with excellent dimensional stability. Colorings include blue-and-green, gold, brown, cinnamon, and green.

Greeff Fabrics, Inc. **109**

109



Wall Furniture Saves Space

Storage and work space are provided in this system of wall furniture, designed by Poul Cadovius and imported from Denmark. Modular components — shelves and cabinets, 31½" long of oil-finished teak or walnut — attach to matching wall rails. Other component units include a selection of desks, tables, cabinets, bar, TV shelf. Units may be flexibly arranged; may form a room divider by using free-standing stanchions. The system is easily dismantled and assembled.

Royal System **110**

110

(Continued on page 106)

presenting Vina-Lux®

. . . the new vinyl asbestos tile with color-chip styling

From Azrock! Another exciting new development in resilient flooring— Heavy Duty Architectural Patterns in Vina-Lux vinyl asbestos tile! Here is a new kind of permanent beauty in color-chip styling for heavy traffic areas . . . because the color chips are distributed throughout the full thickness of the tile — from top to bottom! They are not a surface decoration.

Gives you the answer to your client's demand for an economical color-chip styling in vinyl asbestos tile — America's most wanted type of resilient flooring. In an architectural palette of appealing beiges, greys, green and white, the Vina-Lux 800 Series is specially designed for heavy-traffic institutional, commercial and industrial installations.

Specifications— 9″ x 9″ size. ⅛″ thickness. Six colors. Federal Specification: Manufactured to meet *ALL* requirements of Federal Specification L-T-751, including paragraph regarding the distribution of mottling through thickness of tile!

Write Azrock for samples and complete architectural specifications today.

Specialists in the manufacture of vinyl asbestos and asphalt tile flooring.

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800 Series

HEAVY DUTY ARCHITECTURAL PATTERNS

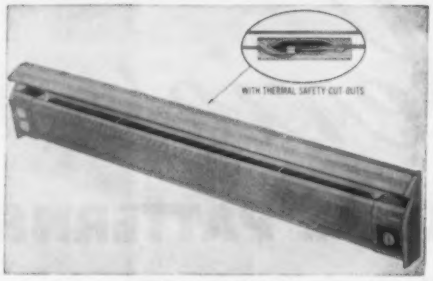
throughout the thickness of the tile--at no extra cost!

AZPHLEX VINYLIZED TILE • DURACO VINYL INDUSTRIAL TILE

(Continued from page 103)

Small Thermostats Prevent Excessive Heat

New "Thermal Safety Cut-Outs" incorporated in electric convection baseboard heaters prevent draperies or furnishings from blocking air flow and causing excessive tempera-



ture in the heater. Small bi-metal thermostats, installed in top leading edge of heater, are wired in series with the heating elements; should temperatures rise abnormally in the heater, heater will be disconnected from power circuit.
Berko Electric Manufacturing Corporation **111**

Intercom System Has New Features

New fully transistorized intercommunication system for executives features hands-free operation and newly developed "magic eye" which indicates who is calling and automatically leaves message. Natural voice tone from distance as far away as 10' is picked up, and transistorized amplifier, preadjusted to acoustical conditions of room, makes caller's voice instantly recognizable. Handset can be added for privacy when others are in room. Security circuits ensure complete privacy; no one is permitted to break in on call.
Dictograph Products Inc. **112**

Stainless Steel Screen Resembles Glass

Woven stainless steel screens replace window bars in mental institutions and prisons. Screens provide ample security and

unobstructed view; creating an all-glass window illusion. Non-institutional appearance is beneficial in corrective therapy.
Fenestra, Inc. **113**

French Doors on Wall Oven Save Space

Wall oven featuring French doors is intended for installation in kitchens where traffic area is limited, since doors require 10" less opening space than conventional swing-down door. Doors swing shut harmlessly if accidentally bumped. Feature provides convenience in being able to stand close to oven for cleaning, loading heavy utensils, etc.
Frigidaire Division
General Motors Corporation **114**

Thin-Shell Gypsum Roofs Provide Economies

Thin-shell roofs, constructed of cast-in-place gypsum on form-boards and steel tees, claim advantages over concrete in being cheaper, lighter, and better in insulating and appearance. Hyperbolic paraboloid shell 2" gypsum can attain a column spacing of 80', with light steel framing at 40' centers and without intermediate purlins. Only skeleton falsework is necessary to control shape of warped surface.
Shell Roof Structures **115**

Louver Doors Now Soundproof

Availability has been announced of first, rated, soundproof, louver door which admits air into a room yet restricts sound transmission. Newly developed sound barrier, intro-

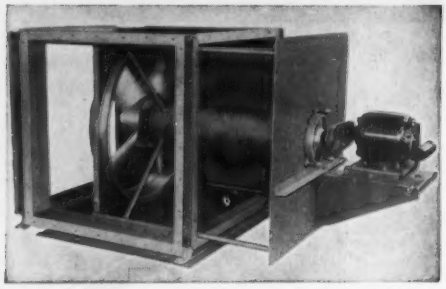
duced into hollow-metal, louver door, reduces transmission of sound to 32 decibels. Application is of particular use in air-conditioned rooms, which require passage of air through doors.
Pioneer Fireproof Door Corporation **116**

Solar Clock Gives Extreme Accuracy

New solar clock is so accurate that deviation is less than two minutes in a quarter century. Unique in design, it provides a focal point in any landscape. Anodized aluminum construction gives ability to withstand all weather conditions. Simple adjustment changes from daylight to standard time.
Modern Sun Dials, Inc. **117**

Fans Have Industrial, Commercial Uses

Recent design of elbow fan for general ventilation or for specialized industrial use can handle clean or slightly contaminated air or fumes at normal or elevated temperatures. Unit occupies only slightly more space than standard elbow



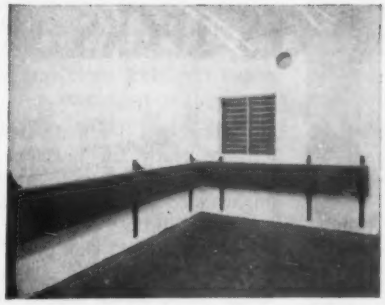
when installed in ductwork. Special construction accommodates corrosive or explosive conditions. Motor and fan assembly can be removed without disturbing ductwork connections. (Illustration shows assembly partially removed.)
L. J. Wing Manufacturing Company **118**

Neoprene-and-Metal Flashing Is Flexible

Resilient, durable neoprene-and-metal flashing assures continuous watertight seals and expansion joints. Neoprene strip is permanently bonded adhesively and mechanically to copper and other metal edgings and overcomes metal fatigue caused by constant expansion and contraction of all-metal joints. Strip "gives" under all temperature conditions from —30 to +200 F, and is impervious to ozone, oils, grease, and chemicals. Because of unusual flexibility, "Expand-o-flash" was chosen by Eero Saarinen for Yale Hockey Rink roof, to withstand abnormal amount of sway in suspension cable structure.
Lamont & Riley Company **119**

Channel Unit Carries All Services

Prefabricated, pre-engineered channel unit will hold all plant power and facility lines. Units—made up in five ft modules, less than three in. in width—may be joined by



unskilled workers to extend service lines into all areas of plant. T-shapes, right angles, and L-shapes are available to permit any type layout.
Alden Systems Company **120**

Lapping Device Gives Leakproof Roofing

Aluminum farm roofing has revolutionary "Rainlock" lapping device with **V** channel over to side instead of in center of rib. This permits top-nailing, eliminates unattractive sagging and bulging of metal between purlins on underside, and insures tighter, leak-proof roof. Available in heavy (.0215) gage diamond-embossed roofing and lighter (.019) gage "all purpose" stucco-embossed roofing. Width is 50", for easy 48" coverage between purlins, and lengths are from 6' to 16'.
Reynolds Metals Company **121**

Seamless-Pipe Systems Are Prefabricated

Seamless steel pipe used in insulated piping systems provides high thermal efficiency, mechanical strength, and durability. Completely prefabricated pipe distribution systems for overhead or underground transmission of hot water, steam, viscous fluids, process liquids, and refrigerants, are designed to specifications of architects and engineers. Pipe is supplied in sizes ranging from 6" to 14" in diameter, up to 41' in length.
Ric-wiL, Inc. **122**

Tinting of Glass in Position Is Possible

Newly-developed flow process is able to tint window glass already in position. Application method is fast and clean, does not interrupt business operations, and is less expensive than installation of factory-tinted glass. Fading, glare, and heat are reduced considerably, and windows may be washed in normal manner without scratching, peeling, or chipping.
American Glass Tinting Corporation **123**

Color, Design Enliven Printed Fabrics

A collection of printed fabrics, the first for this firm noted for its rich silks, is notable for beautiful color combinations and freshness of design. One group of six patterns is available printed on silk, linen, glazed percale; a second group is available in heavy cotton, heavy and lightweight linen. Boldly-scaled Loch Lomond, on heavy Belgium linen is 54"-wide, available in blue, brown and rust, green and yellow, green and rust. Retail: $12.75.
Thaibok Fabrics, Ltd. **124**

Ceramic Process Lends Itself to Many Uses

Dolomitic, cold-process, textured ceramics are processed from mineral of marble composition, asbestos, and glass fiber. They have a rough finish; are said to be heatproof, waterproof, easily washable. Available in custom colors on bricks, tiles, or tables. Tables, 18" diameter on folding wooden tripods, are $35 net. Tiles, 6"x6", 6"x12", or 12"x12", are $4 per sq ft net.
Albra Cold Process Ceramics Company **125**

Densifier Gives Stronger Concrete

Concrete-retarding densifier, "Symentard," which works by slowing down rate of hydration and not by entraining air, gives stronger, denser concrete with high resistance to cracking. Especially recommended for hot weather pouring to prolong working time without increasing water or air content.
A. C. Horn Companies Division
Sun Chemical Corporation **126**

System Noises Removed by Air Chamber

One-piece, prefabricated, air chamber that will remove "hammer and chatter" from water systems has been introduced. Four steps usually necessary to install such units

have been reduced to one; and new unit cuts down on possibility of leakage inherent in previous methods. "Tap/Trap" is available in 6 in. and 12 in. lengths; over-all diameter is 1 in., which is reduced at one end to ½ in. for use in standard fittings.
Wolverine Tube Division
Calumet & Hecla, Inc. **127**

DOW | **FROM CHEMISTRY: *entire new spectrum of building materials***

Years ago, architects had to restrict their selection of building materials to what was available locally in the way of wood, masonry and glass. Today's architect can choose discriminately from thousands of types of traditional materials plus a whole new storehouse of man-made building products. These are creations of modern chemistry—specialized, uniformly high-quality materials that suggest a host of new design ideas. A few of the newest and most newsworthy are discussed briefly on these two pages.

ROOFMATE*. . . NEW ROOF INSULATION RESISTS MOISTURE, REDUCES LEAKS

Introduced early this year, Roofmate promises many valuable advantages. It's a new insulation developed by Dow for built-up roofs.

The building industry recently greeted a new roof insulation that forms its own moisture barrier, has permanent low thermal conductivity, takes hot bitumens and won't flake, crumble or deteriorate with age. This new Dow insulation for built-up roofs has the same unyielding resistance to water and water vapor as its older cousin, Styrofoam®. Thus, Roofmate helps prevent vapor build-up and resulting "blistering" and leaks—built-up roofs last years longer.

Lightweight Roofmate arrives on the job site ready for business. It's prefabricated in standard roofing sizes, unpackaged but bundled in easy-to-handle 38 lb. lots. Roofmate is easy to cut and fit around vent pipes and other obstructions. It can accommodate the weight of workmen and normal roofing equipment with plenty of compressive strength to spare.

It all adds up to a high-quality, durable roof insulation that saves time, effort and money in any installation.

*TRADEMARK OF THE DOW CHEMICAL COMPANY

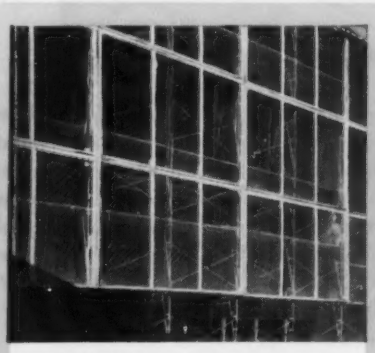
New weather resistant flashing–
SARALOY® 400

Here's a new flexible flashing material that "gives" in all the right places and lasts a lifetime. It's Saraloy 400, a tough, elastic thermoplastic with built-in resistance to water and weather. Saraloy 400 can be fabricated right on the job . . . shaped to conform to every contour. It can be bonded to most building materials, painted with ordinary exterior oil-based paints. And it's durable – won't corrode, check, crack or peel–stays tight and effective long after expansion and contraction would have destroyed ordinary flashings!

SCORBORD®
installs in an instant–lasts a lifetime

Insulating foundations and perimeter heating ducts is a job that's only done once, so it should be done well. That's why more and more architects choose Scorbord, the insulation with permanent efficiency. Scorbord† keeps moisture out, heat in–resists mold and decay. These big 2′ x 8′ pre-scored boards save up to 80% on installation time, too. Scorbord is easy to cut and fit around pipes and other irregular shapes – has plenty of compressive strength to take a concrete slab. An F.H.A. materials release has been issued.

†PATENT APPLIED FOR



POLYFILM. A top quality Dow building product with 1,000 construction uses. Ideal for temporary enclosure or moisture barrier. Supplied in convenient new dispenser box.

LATEX. New latex paints for concrete floors wash easily and are long-wearing. Seals, eliminates concrete dust, makes an attractive surface. Can be tiled over!

STYROFOAM *makes ideal panel* core. Permanent low "K" factor means long-term insulating efficiency. Panels cored with rigid Styrofoam need no special reinforcement.

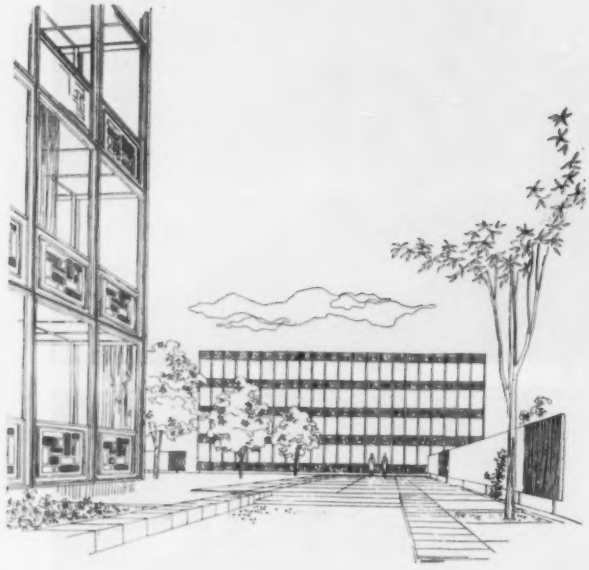
VERSATILE NEW MATERIALS like these are typical of the extensive Dow Building Products line. Most of these products are new but all are tested and proved. Write today for more information on any of them. THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 1602EB11.

Specify DOW BUILDING PRODUCTS for your designs

ROOFMATE* • STYROFOAM* • SCORBORD* (Pat. applied for)
SARALOY* 400 • POLYFILM* • LATEX
*TRADEMARK

THE DOW CHEMICAL COMPANY, Midland, Michigan

DOW



A new development in castings and curtain walls is introduced in a data folder detailing the "CWA-5" wall system. According to the producers, "the system incorporates the sculptured qualities of castings into the advantages of standard metal-wall components." Both fixed glass and projected or vertically pivoted windows may be used. Details shown in folder are applicable to either fascia detailing or wall paneling. Two versions are available for curtain-wall framing: one omits horizontal mullions and uses the cast member to play down horizontal sight-line; the other emphasizes the whole frame by an identical profile of the vertical member and the head. A continuous extrusion overlaps the casting at roof line, forming a gravel stop which also allows the vertical mullion to extend opened at the top, accenting the verticality of the wall.
The Michaels Art Bronze Company **200**

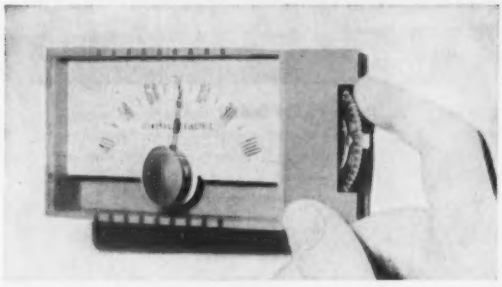
AIR AND TEMPERATURE

Fume Hoods for Laboratories

Booklet describes complete line of fume hoods used to confine odoriferous, poisonous, or corrosive fumes generated in the laboratory. Operation is at face velocities as low as 50 ft per min; excerpts from impartial research contain this and other favorable comparisons over conventional fume hoods. Also presented are elevation, duct location, and roughing-in drawings; face velocity and CFM recommendations; blower data; and hood service and electrical fixtures.
Kewaunee Manufacturing Company (48-p.) **201**

"Balanced Design" Thermostat

Brochure describes new thermostat embodying fundamentals of function, appearance, and dependability in its "balanced



design." Unit functions with unusual precision—temperatures are measured to 1/10 F tolerances. Its appearance is simple and angular. In operation there is maximum resistance to vibrations common in the home.
General Electric (4-p.) **202**

Corrosive-Resistant Glass-Fiber Duct Fans

Bulletin describes new line of glass-fiber belt-drive duct fans which offers exceptional resistance to most corrosive elements common to industrial plants. Propeller, duct section, drive housing, and bearing cover are made of glass fiber; drive shaft and hardware are made of stainless steel. For many applications this type of construction gives performance equal to or exceeding that of all-stainless or all-monel construction, and at substantially lower cost. Fans are available in 20", 24", and 28" diameters, with variety of drives.
Hartzell Propeller Fan Company
(Bulletin A-116, 2-p.) **203**

Chiller for School Air Conditioning

Brochure presents a packaged liquid chiller which is designed especially as part of the unit ventilator system providing air conditioning for schools. Simple to operate and easy to maintain, it gives perfect comfort temperatures in individual classrooms despite varying occupancy conditions. Exclusive internally-finned tubes eliminate problem of low coefficient of heat transfer on the refrigerant side. Construction features, capacities, pressure drop data, application data, and specifications are presented.
American Air Filter Company, Inc.
(Bulletin 675-AI, 15-p.) **204**

CONSTRUCTION

Manual of Membrane Fireproofing

Booklet discusses fireproofing for gypsum lath and plaster assemblies, giving complete construction information for required fire ratings. Detailed drawings cover floor-ceiling assemblies, column encasement, hollow steel stud partitions, solid studless partitions, and exterior wall furring. Full data is included on thickness, aggregate, and proportions of the gypsum plaster.
Gypsum Association (16-p.) **205**

★ Stock Components for Metalwork

Catalog presents full line of stock components for fabrication and assembly of architectural metalwork. Items available in variety of designs are railings; treillage; tubing,

bars, and shapes; mouldings and functional shapes; saddles and nosings; ornaments, hardware, and machinery. Complete scale drawings are shown for all items. Comprehensive, attractive catalog is well indexed for easy reference.
Julius Blum & Company, Inc.
(Catalog No. 8, 138-p.) **206**

★ **Design Data on Structural Aluminum**

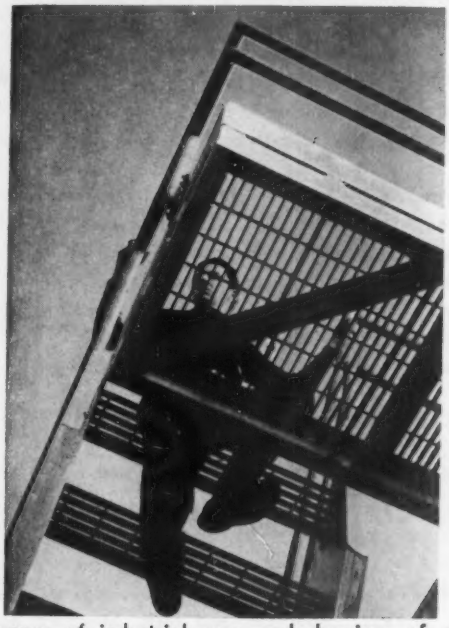
Revised edition of the "Alcoa Structural Handbook" supplies design information on structural applications of aluminum. This "bible" has been the sole manual of its type throughout the 30 years of its existence. The current revision involves changes in text and general up-dating and addition of tables. Extensive data on the aluminum-magnesium alloys, and comprehensive coverage of welded structural design, are included.
Aluminum Company of America (420-p.) **207**

Porcelain Gravel-Stop Fascia

Folder on architectural porcelain gravel-stop fascia describes with illustration, detail drawings, and specifications, how it can be installed after roofing contractor has completed his work. Telescoping corner eliminates need for field measurement, permits flexibility in design, and assures accurate weather-tight installation. Standard depths of 7½" and 10½" are available.
Davidson Enamel Products, Inc. (4-p.) **208**

Electroforged Steel Grating

Catalog of steel grating illustrates several types of construction—electroforged, interlocked, riveted, or U-type.



Photograpns of industrial uses, and drawings of grating spacings, are presented. Electroforged one-piece grating has twisted cross bars permanently forged to bearing bars for strength and sure footing.
Blaw-Knox Company (19-p.) **209**

Insulating Panels Suggest Design Ideas

Presentation demonstrates flexibility of Alply aluminum insulating building panels which offer advantages of design and construction simplification, plus particularly high strength-weight ratio. Panel consists of foamed polystyrene core "sandwiched" between aluminum sheets, one of which may be substituted by other specified materials such as plywood, for example. A typical 3" panel, 4'x8', with aluminum facings, weighs 39 lb, is said to support a 1500 lb distributed load over an 8' span. Available in three types, in choice of designs, colors, finishes (either or both sides); may be ordered in widths to 48", core thicknesses from 1" to 6". Brochure contains complete technical data, also sections describing thermal, acoustical, corrosion-resistant properties, and joining and manufacturing standards.
Aluminum Company of America (24-p.) **210**

Fire-Resistant, Steel-Framed Construction

Booklet compiles significant features of fire-resistant materials and assemblies. Included are sections on modern building codes with reference to general acceptance of performance tests; characteristics of safe, dependable fireproofing materials; concept of "light frame" fire-resistant steel construction; and a reference table showing more than 150 fire-resistant constructions and their ratings.
American Institute of Steel Construction (44-p.) **211**

Color Curtain-Wall System Offers Design Ideas

File sheets describe new Thinlite curtain-wall system, designed and engineered as a total wall. Addition of rectangular, prismatic glass shapes and ceramic fired-on colors in horizontal, vertical, square shapes bring fresh look, advantage of daylight control; provide colorful mosaic patterns. Modular 4'x2' and 5'x2' panels are 2" thick, form both inside and outside finished wall, have extruded aluminum, interlocking perimeters, are secured to struts by simple bolt-assembly system. Basic tints are Ricepaper white, sunlight yellow, cool green. Permanent, ceramic, fired-on exterior colors include Chinese red, golden yellow, indigo, bronze, turquoise green, peacock blue, charcoal gray, ebony. Colors may be intermixed.
Kimble Glass Company
Subsidiary of Owens-Illinois (AIA 17-A, 29-p.) **212**

DOORS AND WINDOWS

Sliding Window With Storm, Screen Tracks

Data sheet presents new four-track sliding window, which includes storm and screen tracks in single frame, thus reducing installation costs. Both prime window and storm sash have full vinyl weatherstripping to assure noise-free air-tight fit. Vinyl strip in the center bar prevents rattles and keeps insects out. All panels are inserted from inside, without tools, and cannot be removed from outside. Details for brick, masonry, and frame construction are given.
Capitol Products Corporation (2-p.) **213**

Plywood Folding Doors for Closets

Folder describes features of space-saving bifold closet doors used in full-width, floor-to-ceiling installation. No header, trim, or bucks are required. Doors are of Novoply, which is guaranteed not to warp, shrink, or swell, in a thickness of ¾", which saves considerable space over standard construction. Full-height opening permits full-depth closet shelves.
United States Plywood Corporation (6-p.) **214**

p/a manufacturers' data

ELECTRICAL EQUIPMENT, LIGHTING

New Electro-Luminescent Light Source

Catalog lists broad line of electro-luminescent "light bulbs" available for commercial applications. Flat "bulbs," called Rayescent, are man's newest light source—use no filaments, gas or metallic vapors; produce practically no heat; consume a negligible amount of electricity; and produce completely diffused light without additional fixtures or baffles. Booklet gives standard sizes; technical data covering operating frequency, voltage effects, maintenance, and power consumption; and sketches suggesting a wide variety of uses.
Westinghouse Electric Corporation (4-p.) **215**

Three Different Pneumatic-Tube Systems

General information handbook on pneumatic-tube systems covers full line of systems used in institutional, commercial, industrial, and hospital applications. These systems use message- or load-carrying carriers that are automatically controlled and directed to stations from a single "main-line" tube. Three different types of systems are able to meet various requirements and traffic capacities. Catalog gives comprehensive coverage of equipment, with decriptions, details of operation, and specifications.
The Grover Company (52-p.) **216**

Mercury Lamps and Ballasts

Folder gives extensive information for more than 50 popular types of mercury lamps. There are listings of physical and electrical characteristics and light-output data; illustrations of typical shapes, coatings, and relative sizes of bulbs. Simplified listing of the necessary auxiliary equipment and the applicable wiring diagrams is also included, to facilitate selection of proper lamps, ballasts, or combination, for use in mercury lighting system.
General Electric Company
(Tech. Publ. LS-103, 8-p.) **217**

Lighting Classrooms, Other School Areas

Booklet deals with classroom and general school lighting problems. Section 1 contains comparison chart of 10 different types of classroom lighting fixtures for standard 30'x32' room, with 50 footcandles maintained, using recommended reflectances. Shows number of fixtures required, footcandles, fixture brightness, lamp life, power required, initial and operating costs; brief evaluation of each of 10 systems is given. Section 2 covers 16 different types of fixtures commonly used for areas other than the classroom, such as libraries, labs, shops, auditoriums, gyms, with illustrations and recommendations for use.
Smoot-Holman Company (20-p.) **218**

Telescopic Door Frames Are Adjustable

Catalog provides complete information on easy-to-maintain new telescopic door frame which automatically adjusts to assure perfect fitting even in irregular ceiling openings. When installed, troffers give precise finished appearance; there are no mechanical catches. General features incorporated as integral part of assembly facilitate installation. Troffers recess 4 15/16", are available in four basic types that fit all popular ceiling systems. Included are 13 separate pages describing spot boxes, wide variety of shielding media, and complete ceiling index.
Smithcraft Lighting (6-p.) **219**

Flexibility in Compact Remote Control Systems

Brochure describes remote lighting control systems for one-man operation. Systems provide all lighting requirements, are custom-assembled in unlimited number of sizes and capacities to meet needs ranging from largest opera house to smallest school stage, consist of two main elements: control console and dimmer bank. Consoles are made in two basic types: Theatron and C-1 form, each available in many sizes, and having similar operational characteristics—Theatron contains controls for two-scene presets while C-1 is available with five-scene, ten-scene, or infinite presets in a separate panel. Ability for expansion is inherent in all systems.
Century Lighting, Inc. (4-p.) **220**

FINISHERS AND PROTECTORS

Fire Retardant Paint

Folder illustrates fire retardant interior paint of outstanding quality, which operates upon contact of fire by swelling of the prime coat, to create a tough insulating mat on combustible surface. Blisters of unusual toughness then form on mat, shielding combustible surface from fire as well as insulating it from heat. Flame-spread characteristics and recommendations on application are given.
F-X of New York, Inc. (6-p.) **221**

One-Operation Treatment for Concrete Surfaces

Brochure contains application and test data on Kure-N-Seal for curing, sealing, and dustproofing newly-poured concrete surfaces in one operation; described as a blend of synthetic rubber resins in fast evaporating solvents, which produces transparent, hard glossy film to protect floor from traffic abrasion, water spillage, mild acids and alkalies. Applies to freshly-laid concrete to promote water retention and complete hydration of cement. Compound minimizes staining on terrazzo and concrete.
L. Sonneborn Sons, Inc. (AIA 3-B-1, 25-B-26, 4-p.) **222**

SANITATION, PLUMBING, WATER SUPPLY

Cast-Iron Soil Pipe, Fittings Standard

Commercial Standard establishes standards for material, principal dimensions, and dimensional tolerances for extra heavy and service weight cast-iron soil pipe and fittings. Information also specifies marking, coating, straightness, weights, threads, inspection, and tests. Standard aims to provide a common understanding of these items among producers, distributors, and users.
Cast Iron Soil Pipe Institute
(Commercial Standard CS188-59, 48-p.) **223**

Control Fittings for Showers and Sinks

Catalog describes fittings to control water flow in showers and sinks, regardless of line pressures, thereby cutting

(Continued on page 114)

Outlasts conventional paint coatings by many years

NEW GLID-TILE

...beautifies and upgrades at the same time!

It pays to specify GLID-TILE for heavy traffic areas in offices, schools, institutions and plants, and for problem areas in food processing plants because of its resistance to impact, abrasion and most chemicals. GLID-TILE is a special polyester resin spray finish that lasts a lifetime. It is comparable in beauty and durability to glazed, ceramic or structural tile, yet the initial cost is substantially less.

GLID-TILE gives masonry block, concrete, plaster, wallboard, metal and wood surfaces a tough, protective finish nearly twenty times as thick as the average paint film in a standard two-coat system. And it is far more durable. For example, tests have shown that under heavy impact, a sub-surface of concrete broke before the GLID-TILE finish was destroyed!

It's almost impossible to scratch or mar GLID-TILE. Most acids and solvents, plus alkaline detergents, grease, oil and hot water won't harm it.

New GLID-TILE is available in eggshell or glossy finishes of almost any pastel color—in plain, spatter or web effects.

The tile-like finish seals and smooths the entire wall including mortar joints—for fast, easy maintenance.

Walls in high-traffic areas retain their tile-like beauty for many years.

✱ For complete details, attach coupon to your company letterhead and mail.

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MAINTENANCE FINISHES
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- ☐ Free specification folder
- ☐ Name of local GLID-TILE applicator

Name_____ Title_____

Company_____

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City_____ Zone____ State_____

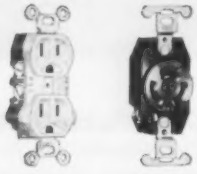
For Dependability Beyond a Doubt Always Specify P&S

"A quality building for quality tenants•" demands quality wiring devices. That's why the beautiful new Canada House at 680 Fifth Avenue in New York uses P&S 20AC1-I super AC switches. A good reason, too, why P&S 5252-I and P&S 7310's are also used.

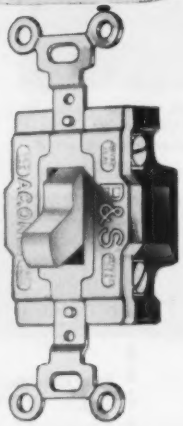
P&S 20AC1 heavy duty AC switches are designed with extra-heavy silver alloy contacts mounted vertically at the *nodal point* (point of least vibration) to avoid excessive vibration and eliminate arcing and poor contact. P&S super AC switches can be used at full rated capacity for tungsten filament lamp loads and fluorescent installations.

•Slogan for the new Canada House

For information on these and other P&S wiring devices write Dept. PA 1159.



5252-I 7310



20AC 1 Ivory

P&S PASS & SEYMOUR, INC.
SYRACUSE 9, NEW YORK

60 E. 42nd St., New York 17, N. Y. 1440 N. Pulaski Rd., Chicago 51, Ill.
In Canada: Renfrew Electric Co., Ltd., Toronto, Ontario

For more information, turn to Reader Service card, circle No. 311

p/a manufacturers' data

(Continued from page 112)

water-heating costs and water usage by one-half. Flow-control fitting is an integral part of the shower head or fitting, requiring no special installation. Long life and quiet operation are insured by use of nylon and neoprene. Catalog of complete line of fittings gives technical data, flow-rate charts, and illustrated features of all models.
Speakman Company (16-p.) **224**

SPECIALIZED EQUIPMENT

★ **Equipment for Complete, Planned Playground**

Catalog states that since playground equipment now provides almost all of a child's outdoor activity (in contrast to earlier times), it should be designed for especially stimulating and creative play. This principle has led to an imaginative collection of playground equipment, where

sculptural forms and constructions makes tree houses, mountains, space stations, and cages. A giant size aluminum alphabet serves as a name sign and as climbing apparatus. Units of equipment are variously assembled to suit 5 age groups, from 18 months to 13 years. Consultation service will plan complete playground, including preliminary analysis, model, and slide presentation. Price list and construction details are given.
Playground Corporation of America
(Catalog A, 48-p.) **225**

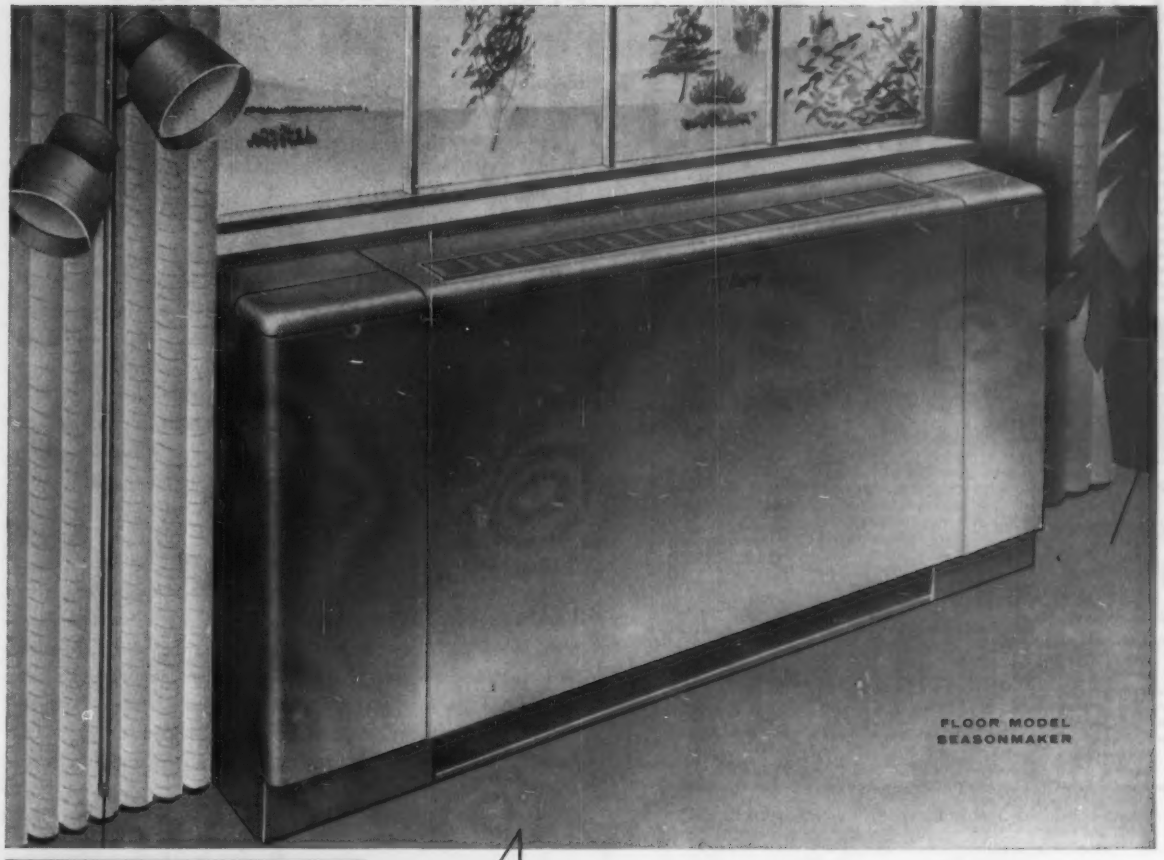
Push-Button Scene Shifting

Folder describes push-button system of scene shifting which operates without conventional rigging and gives new freedom to the designer of stage houses. Much presently wasted fly-and-wing space is eliminated, structural-steel requirements are cut, backstage danger and clutter are relieved, and the pin-rail and fly gallery are removed. Advantages to architect, set designer, and stage manager are evident.
J. R. Clancy, Inc. (8-p.) **226**

Guide to Commercial Electric Kitchens

Annual fact book on commercial electric-kitchen equipment is a comprehensive buyer's guide to products of 91 leading manufacturers. 383 items are listed, under 20 major categories of equipment: ranges, ovens, coffee makers, fryers, steam cookers, refrigeration equipment, ice machines, etc. For each item there is a photograph and

(Continued on page 116)



5 SIZES EACH
only 8½" thin

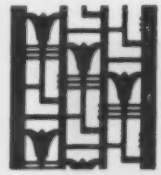
4 new thin-line design INDIVIDUAL ROOM SEASONMAKERS...

These McQuay thin-line design Seasonmaker individual room air conditioning units are only 8½ inches thin and 25 inches high or deep, and offer you more compact, modern styling, requiring a minimum of installation space.

There are four models—each in five sizes, 220, 330, 440, 520 and 640 cfm. The four smaller sizes are equipped with 1050 rpm motors, while the largest has 1500 rpm. Hand-of-coil connections are easily reversed in the field. Filters are changeable without removing decorative panels.

All McQuay Seasonmakers are ultra-quiet in operation and furnish individual room comfort at any desired temperature level. They are quick and easy to install and service, and ideal for multi-room buildings such as hotels, motels, schools, hospitals, offices and residences. Call the McQuay representative in or near your city for complete information about these new thin-line design Seasonmakers, or write McQuay, Inc., 1638 Broadway Street N. E., Minneapolis 13, Minnesota.

McQuay INC.
AIR CONDITIONING • HEATING • REFRIGERATION



It's **H & K** for

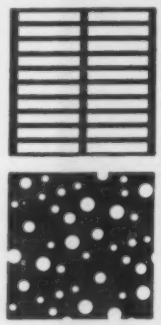
ARCHITECTURAL GRILLES

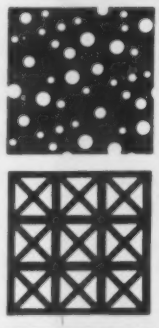
(Write for H&K Grille Catalog)

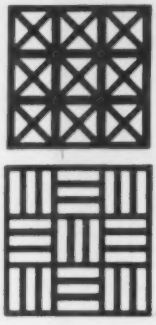
—and—

DECORATIVE PERFORATED MATERIALS

(Write for General Catalog 75)







A wide selection of designs assures you of the motif "just right" for your plans. H & K perforated metal grilles are furnished in accordance with the architect's specifications for type of metal—gauge—finish — and margins. Decorative perforated materials include metals, wood, composition, plastic.

FIND NEAREST H&K AGENT in the 'Yellow Pages'

See Sweet's File—30f/Ha Listed Under "Grilles"

THE **Harrington & King** PERFORATING CO. INC.

Chicago Office and Warehouse
5675 Fillmore St.
Chicago 44, Ill.

New York Office and Warehouse
114 Liberty Street, Dept. PA
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ELECTRIC HOT WATER HEAT TO 2,000,000 B.T.U.

- 40,948 B.T.U. to 2,000,000 B.T.U. Output.
- All units meet the requirements of the ASME Boiler and Pressure Vessel Code.

PRECISION *Electric* HOT WATER HEATING BOILER

- **Complete unit ready for installation** with circulating hot water system and water chiller for year-round air-conditioning.
- **Conversion easily accomplished** where other type fuels now used. Suited for homes, churches, apartments, hotels, motels, hospitals, commercial buildings, swimming pools, snow melting and domestic hot water. Temperature Range 60 to 250 degrees.
- **Every unit tested and inspected.**

Write for color brochure and prices.

PRECISION parts corporation
400- PA North 1st. Street
Nashville 7, Tennessee

No ducts! No noise! No chimney! No odors! No flame!

For more information, turn to Reader Service card, circle No. 314

p/a manufacturers' data

(Continued from page 114)

detailed information as to electrical specifications, performance, features, dimensions, and ordering information. Write for copy; enclose $1.00.
Food Service Magazine, 2132 Fordem Avenue, Madison, Wisc. (74-p.) **227**

High-Fired Stoneware Pottery

Folder illustrates architectural pottery made of high-fired stoneware which can be used for plant pots, fountains, lanterns, and ash receptacles. These prize-winning designs are simple and handsome. Sufficiently porous for plant health, pottery comes with or without drainage holes; when used indoors without drainage holes there is no leakage. Stoneware is treated to retain original off-white color; glazes in matte white and matte black are also obtainable.
Architectural Pottery (4-p.) **228**

Contemporary Office Furniture

Three catalogs show complete line of contemporary office furniture which offers distinctive colorful styling and exclusive features of engineering and construction. One-piece construction of desks provides maximum strength and rigidity. Tops are extremely hard, wear-resistant surfaces. Chairs are tailored to specific uses for comfort and convenience. Storage units, tables, and accessories harmonize with line.
Steelcase, Inc. (44-p., 14-p., and 20-p.) **229**

SURFACING MATERIALS

Specifications for Resilient Flooring

Basic Guide Specifications offers specifications for every major type of resilient flooring. Each specification, abridged and edited from regular comprehensive specifications, is presented in convenient perforated sections to facilitate office use on particular jobs. List of the comprehensive specifications, which will continue to be available, is included.
Armstrong Cork Company (18-p.) **230**

Underfloor Space Access in Data Rooms

Bulletin shows actual installations of floating floors which give infinite access to underfloor space in computer and data-processing rooms. Illustrated features of floor are interchangeability of die-cast-aluminum floor plates, ease with which plates can be lifted out, installation of cutouts for cables, and use of floor as a pressurized plenum. Specifications are included of a recently introduced model that eliminates supporting steel frame.
Floating Floors, Inc. (8-p.) **231**

Hardwood Paneling with Baked-On Finish

Folder introduces new line of prefinished hardwood paneling which has an infra-red baked-on finish. Process gives a hard durable surface which is super-resistant to scratches, stains, mars, and moisture. Extra stability is achieved by back-sealing each of the panels. Sizes are 4'x7' and 8'x10', in wide variety of woods.
Harbor Plywood Corporation (4-p.) **232**

MACOMBER ALLSPANS

STANDARD FOR STRENGTH • COAST TO COAST

Nationwide acceptance of Macomber ALLSPAN floor and roof framing members typifies the confidence earned by Macomber products throughout the building industry.

STRUCTURAL ENGINEERS specify ALLSPANS confidently as an engineered product with higher reserve strength — produced under an unequalled quality control program.

ARCHITECTS appreciate the convenience of ONE high-strength product, ONE load table, ONE manual covering the full span range to 120 feet.

GENERAL CONTRACTORS like the clean appearance — good workmanship — simplicity of erection — all leading to satisfied customers and repeat business.

Get YOUR next job scheduled early. Mail the coupon for full information.

NEW DESIGN MANUAL
Exclusive structural and economy advantages ... exact information for framing 8 to 120 feet.

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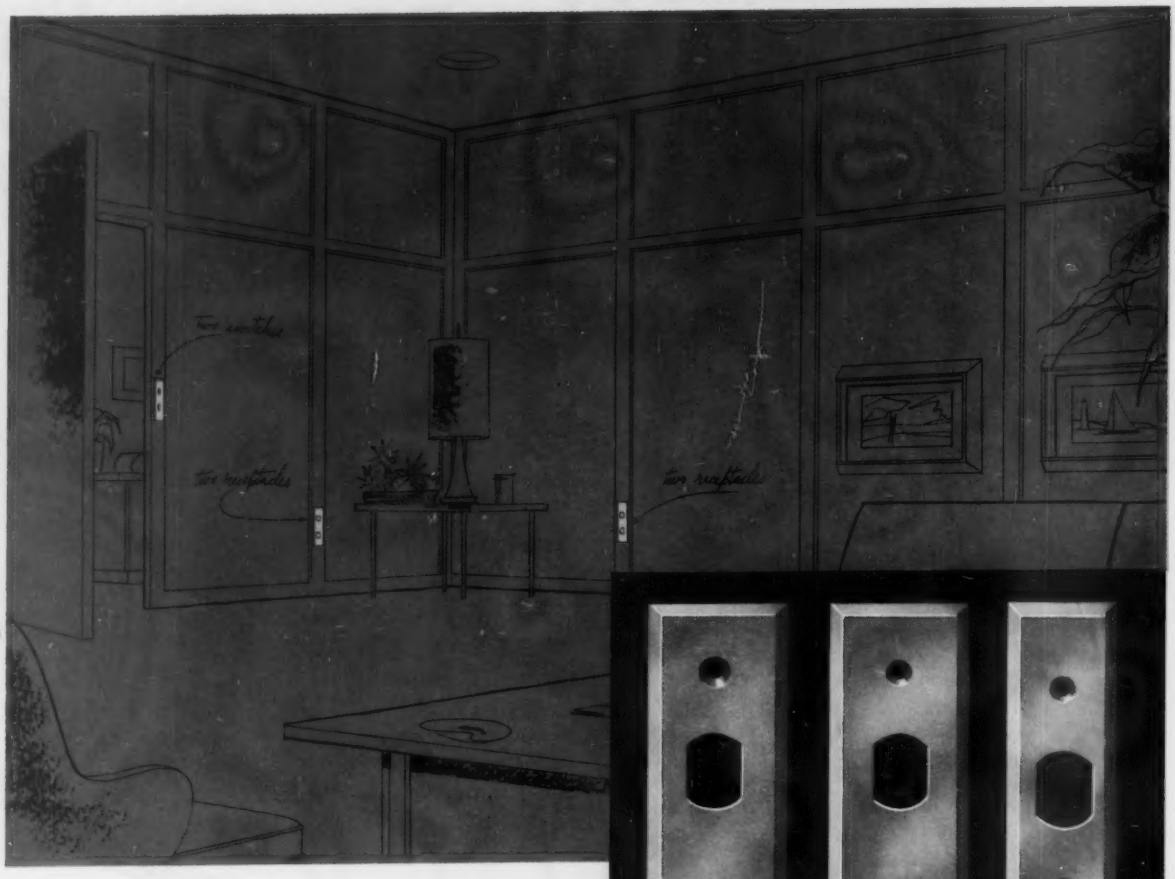
COMPANY.....POSITION.....

ADDRESS.....

CITY.....STATE.....

MACOMBER

CANTON 1, OHIO



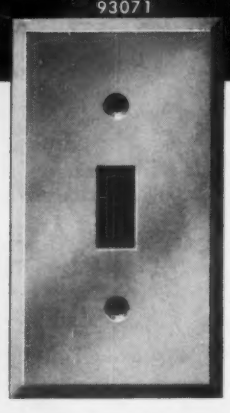
new

trim-line, narrow wall plates of stainless steel —

Ideal for use in movable partitions in commercial and industrial installations. Made of high quality, high nickel 302 stainless steel (18% chrome, 8% nickel). *Will not rust.* High resistance to most organic chemicals and have passed the well-known Salt Spray Tests. Arrow-Hart's H&H Specification Grade Interchangeable Wiring Devices fit these neat, durable wall plates. Available with 1, 2 or 3 openings, or blank.

you cannot specify better wall plates!

Write for complete information to:
The Arrow-Hart & Hegeman Electric Company
Dept. PA, 103 Hawthorn St.
Hartford 6, Connecticut



STANDARD STAINLESS STEEL WALL PLATES

Made of the same high quality 302 (18-8) Stainless Steel, these new standard wall plates are attractive and maintenance-free. Available in a complete line, 1 to 3 gangs.

ARROW-HART OF HARTFORD

WIRING DEVICES • MOTOR CONTROLS • ENCLOSED SWITCHES • APPLIANCE SWITCHES

WHEN YOU THINK OF WIRING DEVICES, THINK OF ARROW-HART

For more information, turn to Reader Service card, circle No. 316

Looking Forward to December PROGRESSIVE ARCHITECTURE

CRITIQUE

Scheduled for DECEMBER P/A is a thoroughgoing presentation and critique of one of the most distinguished apartment buildings of recent years—Wilshire Terrace, Los Angeles, by Victor Gruen Associates. Associate Feature Editor Ilse Reese, who was taken cross-country on her research for this critique, will closely examine Wilshire Terrace both as a building in itself and as an indication of those paths that are desirable to follow in apartment house design.

PROGRESS REPORT

This favored P/A series will be focussed in December on the young Pasadena, Calif., firm of Ladd & Kelsey. Already prominent in residential design, Ladd & Kelsey has in recent years broadened its scope; hence buildings in the categories of commerce, industry, and education will be shown, in addition to some excellent houses.

RELATED DESIGN FIELDS

A stellar cast worked under direction of Architect Philip Johnson to design New York's new Four Seasons Restaurant and its amenities. The contributions of each of these designers will be discussed, as will the total effect of their creation.

THREE CHURCHES

Uniquely different in character, and yet all creating the desired goals of reverence and worship, the following churches will be presented in December: Concordia Evangelical Lutheran Church (N. C.) by A. G. Odell, Jr. & Associates; Church of Baranzate (Italy) by Angelo Mangiarotti & Bruno Morrassutti; and Trinity Lutheran Church (Calif.) by Belluschi and Skidmore, Owings & Merrill.

Frank J. Miller

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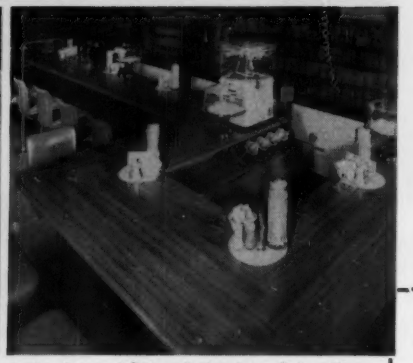

Interior decorations, Motorlodge, by Maxwell Co., Miami • Furniture and fixtures by Leathercraft, Inc., Miami

81

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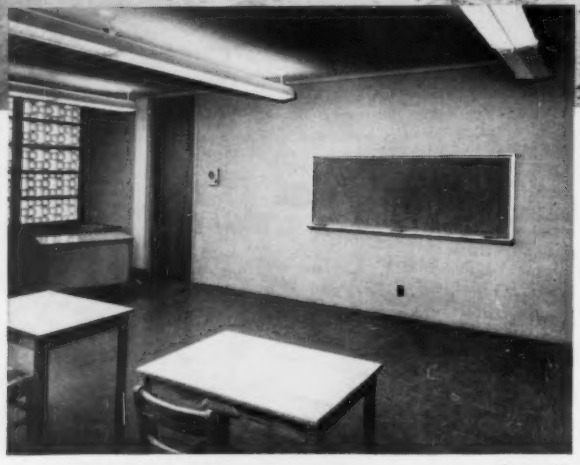

CARVER JUNIOR-SENIOR HIGH SCHOOL
and EDWARDS ELEMENTARY SCHOOL
New Orleans, La.

Architects: CURTIS & DAVIS

Consulting Engineer: WALTER E. BLESSEY

General Contractor:
J. A. JONES CONSTRUCTION CO.,
Shreveport, La.

Sunscreen Units and Block produced by:
LOUISIANA CONCRETE PRODUCTS, INC.

Precast Units furnished by:
CONBLOX, INC.
JAHNCKE SERVICE, INC.
(All of New Orleans, except as indicated)

● Modern concrete products are keeping pace with the best in architectural design for structures of all kinds. A prime example is this beautiful school in New Orleans, recently built at a cost of $11 per square foot, serving 4,000 pupils in 13 grades.

A highlight of this school's design is the use of attractive concrete masonry sunscreens on all classroom buildings. Extending as much as 900′ in length and two stories high in some cases, these screens soften and diffuse the direct rays of the sun, preventing eye-damaging glare on blackboards and textbooks. They help cool the interior and filter out playground noise.

Specially-proportioned three-cell concrete block, made of Lone Star Portland Cement and Ocala limestone, was developed for the screen by Louisiana Concrete Products, Inc. These were laid up in a staggered pattern with deep structural mortar joints, presenting a beautiful, light, lacy appearance. Lone Star Masonry Cement was used in all mortar work.

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the architect's family as client

An architect's proficiency is often best revealed in the design of his own house, where, for once, he is in a position to control not only the program (his wife willing) but also the solution. In three of the four houses discussed here, the architects were designing for their own families; the other house was planned for the architect's parents. The architectural solutions, as widely dissimilar as the temperaments of the individual architects, are illustrated on the following pages.

Ben Schnall

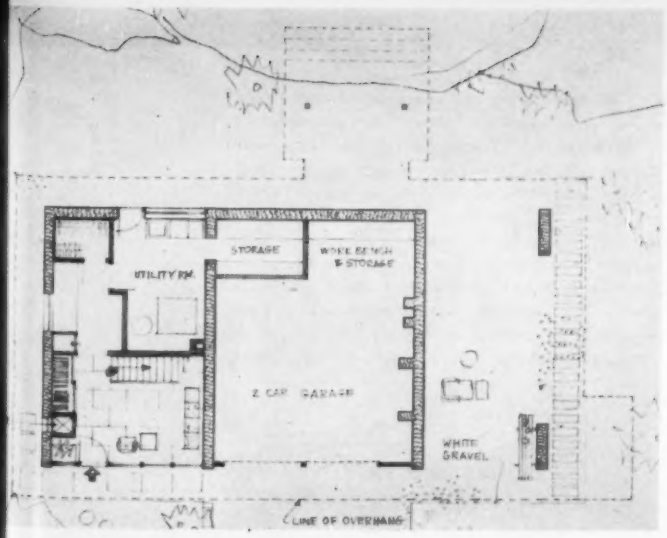
esthetics—but not at the expense of practicality

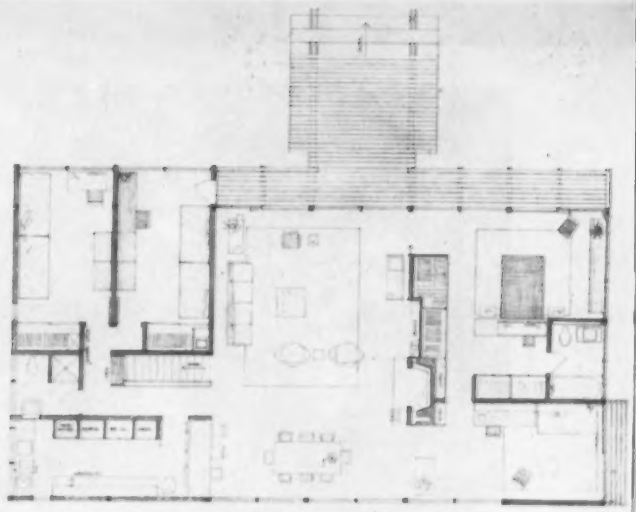
architect: Ladislav L. Rado
location: Chappaqua, Armonk, New York

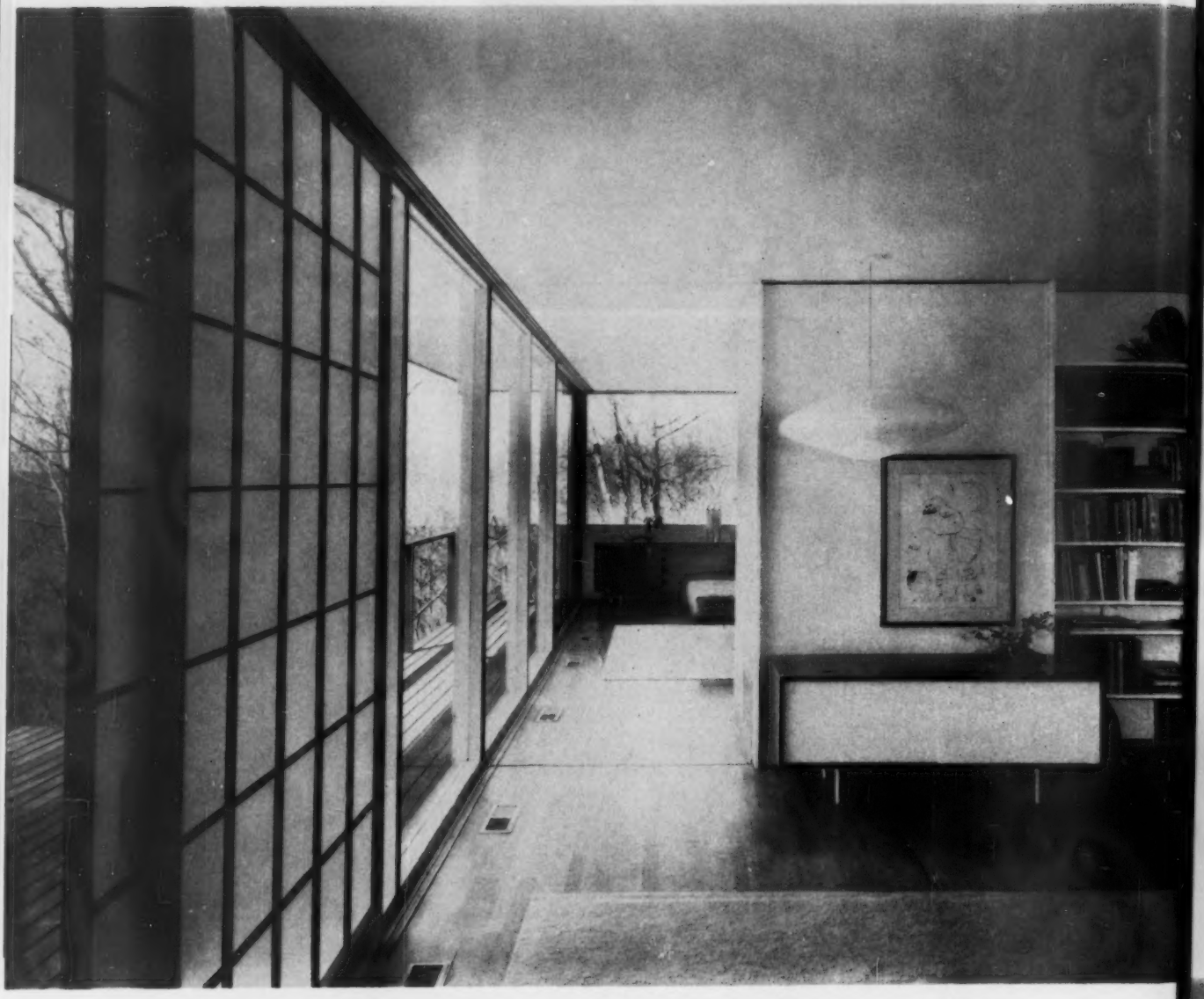
This house is located in one of the outer suburbs of New York City. The seven-acre site had long been spurned by local builders because of large rock ledges, but it attracted the architect precisely because of its unspoiled natural attributes. The difficult site has been skillfully used to advantage by Rado, who counterpoised the irregular topographical formations with an architecture of great precision and simplicity. By raising the main portion of the house above the ground level he has avoided costly excavation problems, and at the same time has secured more sweeping views outward from the living areas. In planning this house for his family the architect wished particularly to attain "spaciousness—though not at the expense of heavy house keeping," and, "an esthetically pleasing composition—though not at the expense of practicality." The upper floor, measuring approximately 2100 sq ft, contains the main living areas, kitchen, three bedrooms, and two baths. Spaciousness has been achieved by opening all of the living areas onto each other, except for two children's rooms, and by creating a lively progression of spaces from the small to the large areas. The upper floor is approached by stair through an entry hall at ground level. A dumb-waiter has been installed to convey foods to the kitchen upstairs. Various service rooms, a two-car garage, and a covered terrace are also at grade level. Structurally, the upper floor is a wood frame, supported by concrete block piers and bearing walls. The exterior of the house is surfaced with cedar siding; plywood and gypsum wallboard are used inside.

Ladislav L. Rado is a member of the architectural firm of Raymond & Rado; Paul Weidlinger was the Structural Engineer; August Nelson, Contractor.

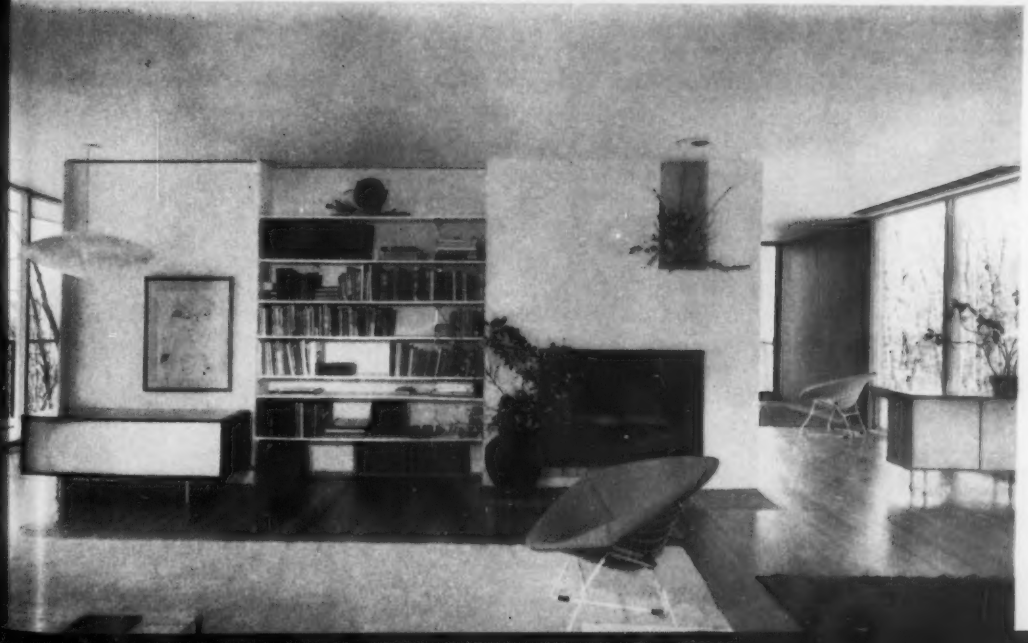
Photos: Ben Schnall







By keeping structure and materials extremely simple and decorations to a minimum, the spatial quality of the house is heightened and the contrast between natural forms and structure emphasized. Beyond the fireplace wall of the living room (acrosspage bottom) *are a study and the master bedroom. A portion of this wall may be moved to close off bedroom. In the opposite direction the living room "borrows" space from the stair hall and kitchen. The view into the kitchen may be barred by a curtain behind the pass-through cabinet, which also serves as a bar. In the north and south directions the landscape provides the visual terminus.*

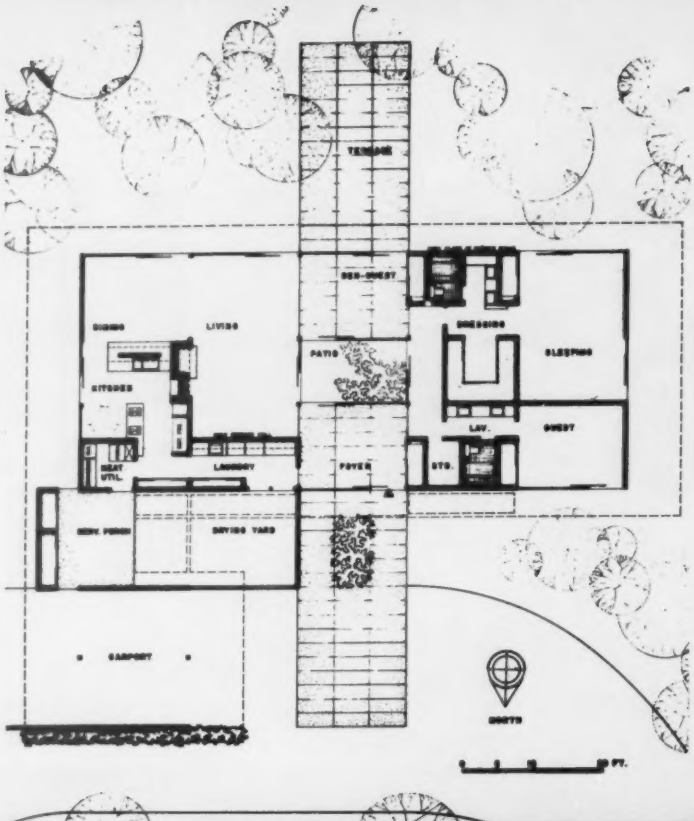


Visual continuity exists even between study (above) *and master bedroom. Dressing room* (left), *between the two areas is closed off partially by a shoji. Similar floor-to-ceiling screens, taking the place of curtains, can be rolled to any desired position along the south window wall.*

something open, ordered, graceful, protective, and happy

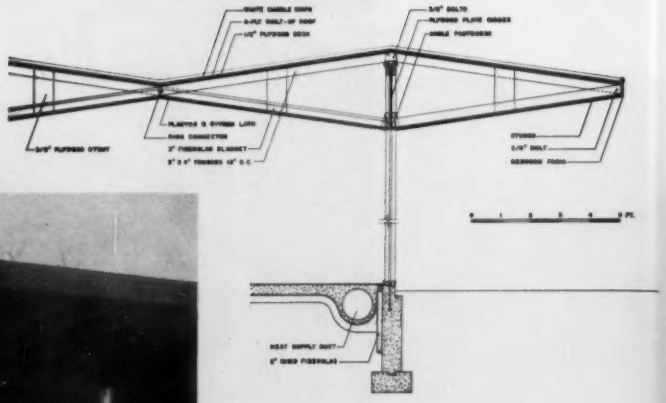
architect: Anthony Ellner, Jr.
location: Long Island, New York

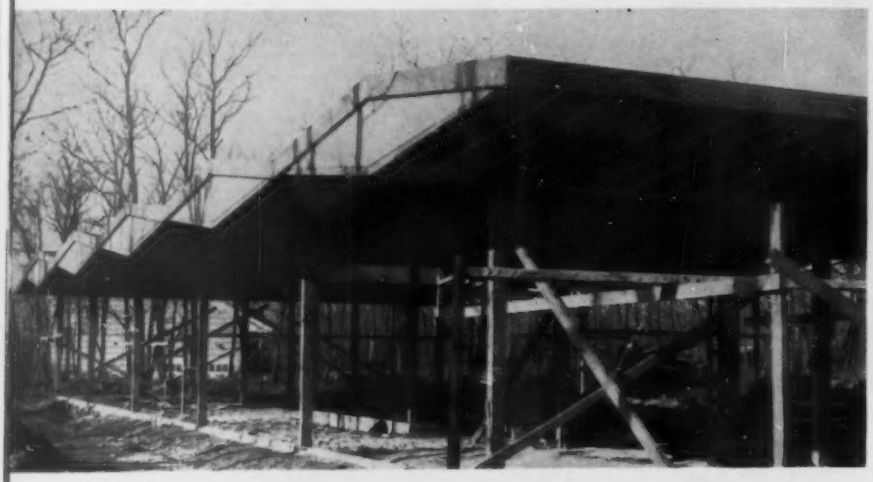
Photos: Gottscho-Schleisner


TERRACE
BED-SHEST
DINING
LIVING
PATIO
DRESSING
SLEEPING
KITCHEN
LAV.
SHEST
HEAT UTIL.
LAUNDRY
FOYER
STO.
SERV. PORCH
DRYING YARD
CARPORT
SHOPS
FT.

In this case the architect's parents were the clients. They desired a house on one level, a house without over-large or seldom used areas. Gardening and the lighter aspects of maintenance were to be managed by the owners, mostly to provide recreation. Entertaining was to be limited to small groups. The architect relates that in planning the house for its heavily wooded, private site, "the character of a woodland pavilion continuously reasserted itself . . . a structure based on posts spaced widely in both directions, with a central area open to the sky which would daylight an unusually placed living area." For ease of access and servicing, the entrance and utility areas were placed toward the north; the major living and sleeping areas toward the south and the view. "The combination of deciduous trees and deep overhangs," writes Ellner, "introduced sun and shade when and where it was wanted." The structure consists of rigidly connected posts and plywood girders. Spanning between the girders are 2″x4″ members running 16″ on centers, crossed and joined at the center by ring connectors. The roof framing is topped by ½″ plywood and a 5-ply built-up roof *(detail overpage)*. This system was devised since it offered lateral stability in both directions, an airspace for ventilation, and a runway for electrical wiring, and permitted roof overhangs on all four sides of the house. The floor is a 4″ concrete slab on a 3″ gravel base. Heating is by forced warm air through a perimeter duct in the floor slab. The exterior surfacing material is T&G vertical redwood siding.

the architect's family





"The structure (detail above) *of this residence," writes Ellner, "might be termed experimental since there was, to my knowledge, no precedent at the time of its inception. However, it was as logical as the bridging of joists to which it may be compared."*

In progress photo (top) *the structural system is in place. Roof decking and concrete slabs are being installed simultaneously.*

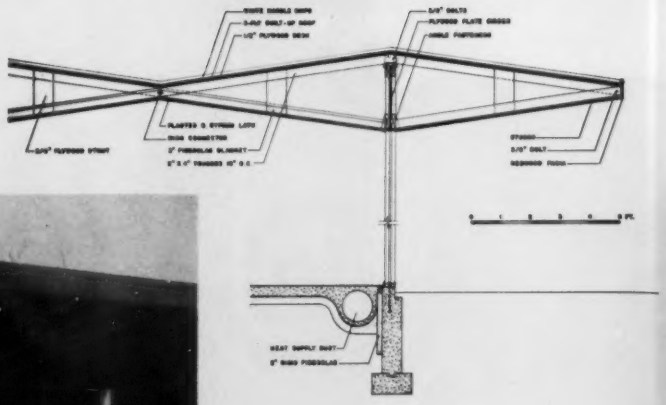
Interior finishes, as in dining room (center) *and kitchen* (bottom) *are primarily of redwood and mahogany, which supply the dominant background color. Other surfaces are white or beige with fabric accents of blue-green and black.*

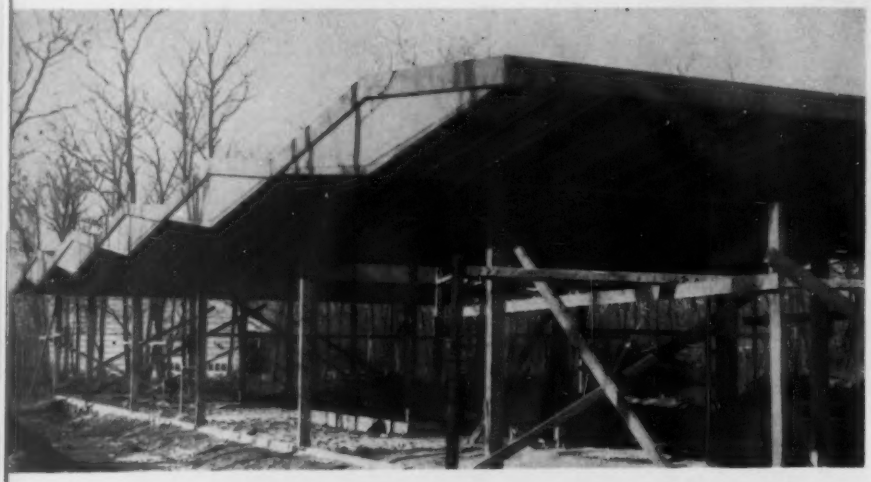
the family should feel itself a unit—thus, the circular plan

architect: Cecil A. Alexander
location: Atlanta, Georgia

Galfas Studios

the architect's family





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the family should feel itself a unit—thus, the circular plan

architect: Cecil A. Alexander
location: Atlanta, Georgia

Gulfas Studios

the architect's family

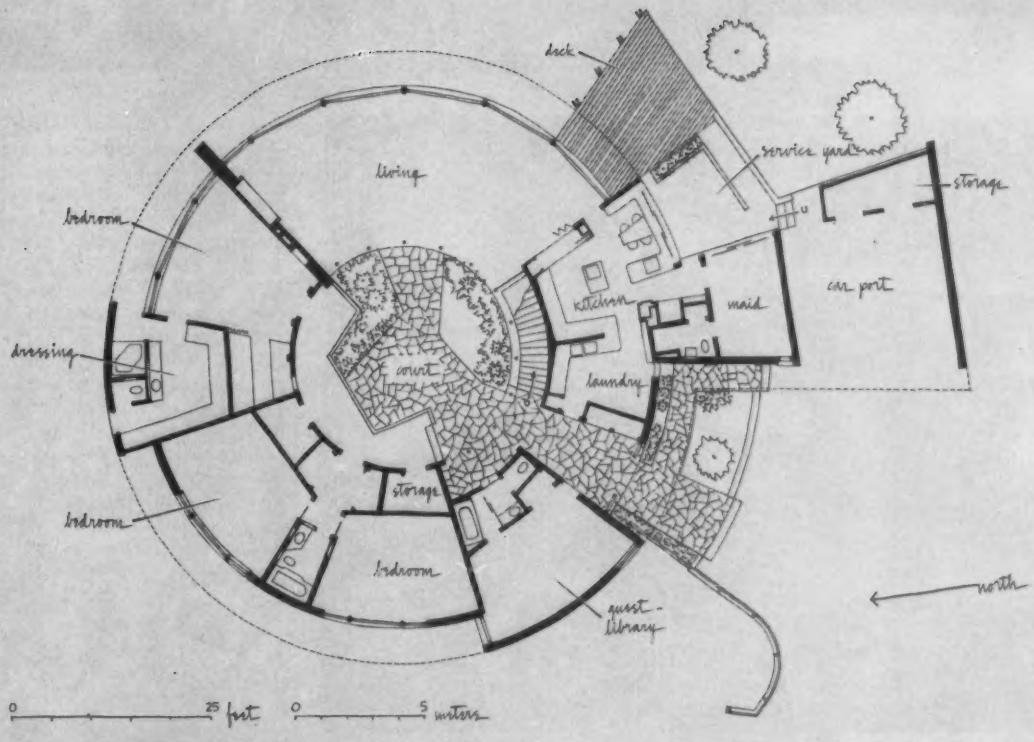
Photos (except as noted): Robert McGinnis

This house was to provide practical space for: 1. a family of four—the architect, his wife, two young daughters; 2. the entertainment of small and large groups of guests; 3. the accommodation of a semi-invalid regular visitor. All of these requirements were met by a scheme in which all major functions were placed on one level. Site for the house is a 6½-acre plot within the city limits—on the knoll of a hill. A wide, flat ridge extends from the lower level, which contains a recreation room, storage and workshop areas. "The house was designed with a very definite conception of family living in mind," writes Alexander. "It was our conception that the family should feel itself a unit—thus the circular plan. At the same time each individual should be recognized—thus the rooms are all oriented out to their own view. The central, covered and skylighted court *(overpage)* has constituted a constant place of meeting." Whether such a house might have been designed for another client was answered "yes—if the client wanted to risk an experience that is not entirely predictable, either financially or architecturally." While the architect suggests that the folded plate roof may have been primarily a structural exercise "it has come to have an architectural meaning beyond structure in the way light is admitted through it."

The structural system is post and lintel in the flat roofed area, using steel columns and light steel beams. The folded plate *(acrósspage top)* is a frame made up of two plywood surfaces bolted and screwed to a 2″x4″ frame. A continuous cable under tension supports the thrust. *(Selected Detail, p. 170)*. Exterior materials are brick and cypress wood.

Cecil A. Alexander is a member of the firm of Finch, Alexander, Barnes, Rothschild & Pascal, Architects. Edward Daugherty was the Landscape Architect; Florence May, Consulting Interior Designer; Demetrius Polychrone, Consulting Structural Engineer; Adams & Willis, General Contractor.

Gálfas Studios

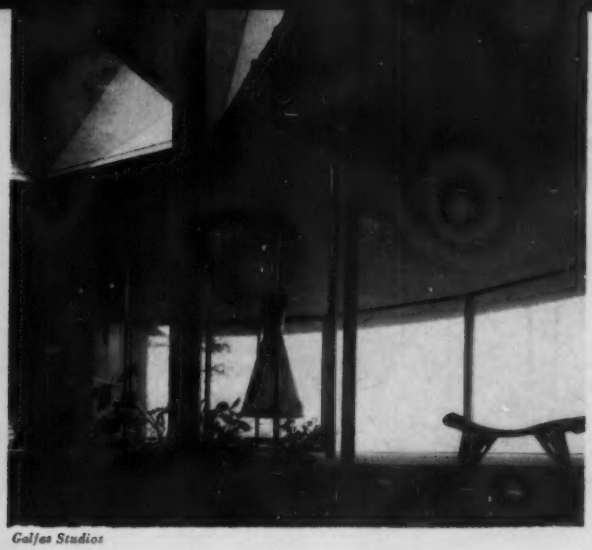


the architect's family

Photos (except as noted): Robert McGinnis

Only visual demarcation between living/dining room (left, above, acrosspage top), *and the skylighted central court* (acrosspage center) *are the steel columns which were given a natural rubbed finish. By opening these areas toward each other interesting architectural spaces, views, and light effects have been attained. A serving counter extends this flow of space even into the kitchen* (acrosspage bottom).

Interior surfaces are of subdued color and texture, in order not to compete with the architectural spaces. Focal point in the living room is a free-standing copper fireplace; walls are of walnut or brick; flooring of wood. Kitchen cabinets are finished in ribbon mahogany; the kitchen floor is of white plastic tile; the wall-hung refrigerator is of yellow porcelain enamel.



Golfes Studios

Photos: Else Tholstrup

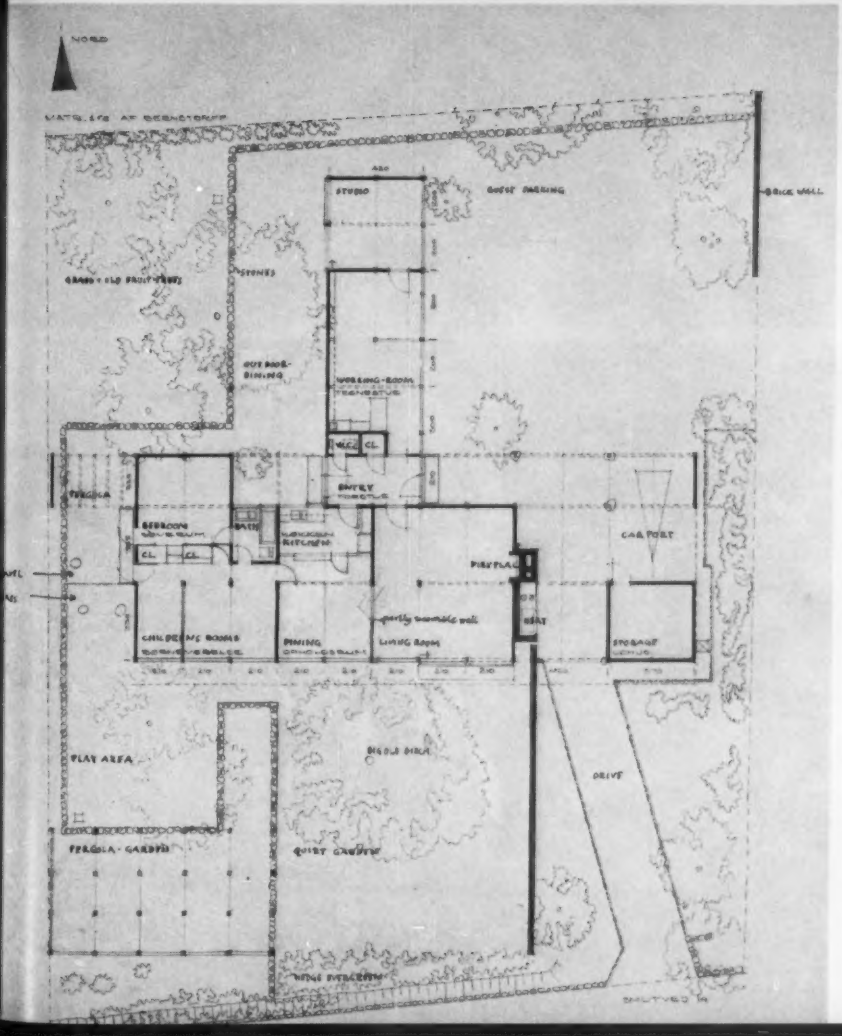
easy to rebuild and flexible for the growing family

architect: Erik C. Sorensen
location: Charlottenlund, Denmark

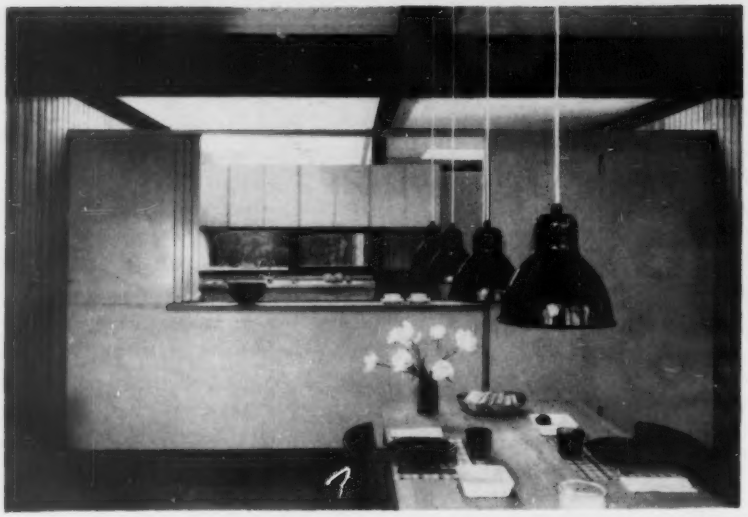
Office space for the architect/owner and living quarters for himself and his family have been combined here under one roof. The building was constructed on part of a cultivated garden plot in a built-up residential section. Arranged in the form of a T, the main wing houses a living room, dining space, kitchen, bath, and two bedrooms. The smaller of the two wings is devoted to a drafting room and the architect's own studio. An entry is located at the intersection of the two elements. Several outdoor courts evolved from the T-shaped plan—a guest parking court adjoining the office wing, a fruit-tree and dining garden near the kitchen, a play area off the children's room, and a quiet garden to be viewed from the living and dining room.

Because of the constantly changing requirements of a growing family and office force, a structural system was selected which would facilitate future revisions. A wall, partly movable, has already been installed between living and dining room, and the drafting room has been divided into separate work areas. Intended for later construction are an additional bedroom and bath, which will permit the conversion of the parents' bedroom into a children's playroom. Such changes are possible thanks to the use of the modular post and beam framing system in which all walls are non-bearing. This system was also chosen, writes Sorensen, because "the repetition of the three-dimensional bays of the skeleton construction has an esthetic appeal . . . it unifies the different parts of the plan, and measures each space to a known scale": i.e. every area is related to the basic module.

The building is heated by forced hot water passing through pipes under the floor and through radiators behind ventilating louvers.



The building is composed of two parts—the living quarters for the architect and his family (acrosspage), *and an office wing* (above). *Covered and open parking is provided in a court* (foreground above) *formed by the two wings.*



The living room (above *and* acrosspage) *is located near the entrance so that it can also double as a client conference room. A movable wall makes it possible to close it off from the dining room* (left). *The living room opens onto a quiet garden, screened from the street by an evergreen hedge, and from the driveway by a brick wall. Another brick screen* (acrosspage), *in relief design, is the focal point seen from the studio. Interior finishes are: white ceilings, doors and cabinets painted gray. Bright colors are restricted to oriental rugs, flowers, and art objects.*

the architect's family

Exterior materials of this office/residence are dark-stained wood, glass, gray asbestos, and yellow brick.

Courtesy: Think magazine

automation in schools

by Frank G. Lopez*

In the photograph *(above)* a small boy is using a teaching machine developed by Prof. B. F. Skinner of Harvard, whose specialty is the psychology of learning. There are different types; one, it is estimated, could be mass-produced to sell for around five dollars. They have been used in teaching mathematics, science, spelling, grammar, reading and so on. They teach by channeling reactions in a desired direction, a little at a time, and by "rewarding" the student (telling him he is right or wrong) instantly—not by punishment for mistakes. A question or problem appears in the machine's window; the student answers by selecting from a multiple-choice list or by solving the problem and inserting his result in another window; he then turns a crank or pushes a button and finds out whether he is right. If so, he goes on to the next.

Is learning that simple? Amassing a store of facts and possibly some elements of judgment in their use may be; but the best machines are no substitute for experience in putting facts to work. It is possible to read for hours about a theory, for example, without understanding it one whit; whereas simple block-building demonstrates unforgettably what wholes and fractions are, and observation of a tea kettle has opened a world of science. A teaching machine is excellent for the rote-work necessary to instill the many facts which each student must accumulate in his automatic memory.

Nevertheless, machines, properly employed, can be invaluable tools. Many types are useful in schools, including public address and program systems (provided these are not used to create an unwholesomely authoritarian atmosphere), educational television (if the mass medium is adapted to individual needs), program schedule and attendance machines using punch cards (when they are used creatively), and many others. The design implications of two types are discussed in the following pages: those used in language laboratories and those used in kitchens. The latter may surprise some readers, but the modern school kitchen depends on equipment which, as much as possible, is automatic.

** Frank G. Lopez, A.I.A., is a member of the firm of Engelhardt, Engelhardt, Leggett & Cornell, Educational Consultants.*

language laboratory

Language laboratories are expensive but they can be excellent teaching tools. They have some great advantages and some limitations. Whether the school that installs one receives full value for the necessary expenditure depends in part on how full is to be the educational utilization of the electronic aids.

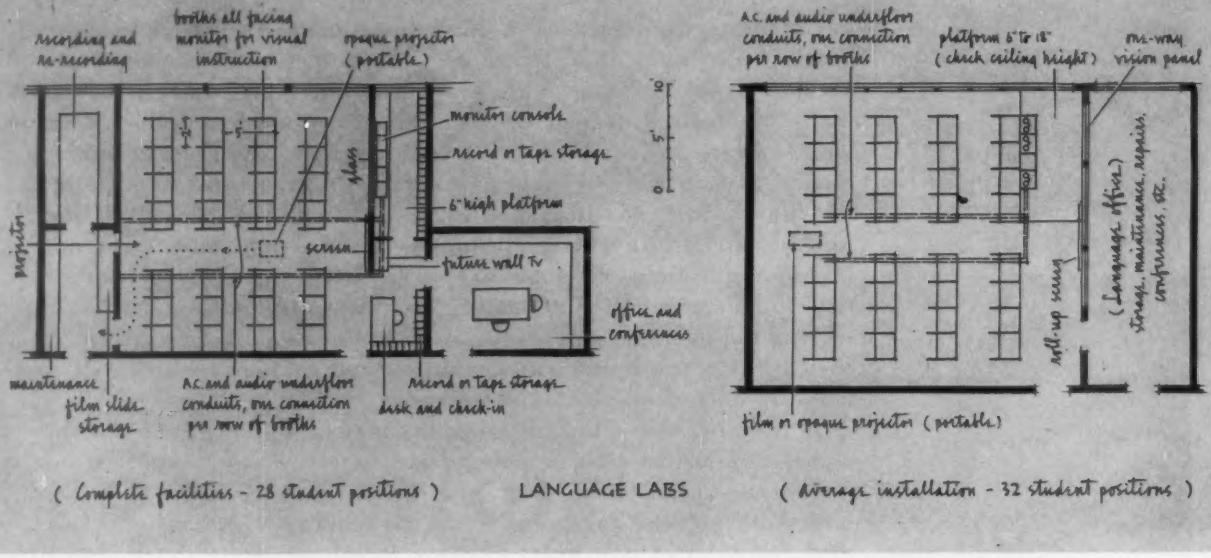
Since the architectural provisions, starting with the location and plan of the laboratory and including both the equipment and its environment, strongly affect utilization, a summary of the ways language laboratories can be used is included so an architect can understand what he is doing to the educational process as he shifts the elements around. The following categories have their faults; like many, they are arbitrary and inexact; and they should be used with caution.

Laboratory Utilization. Several degrees or types of utilization are possible:

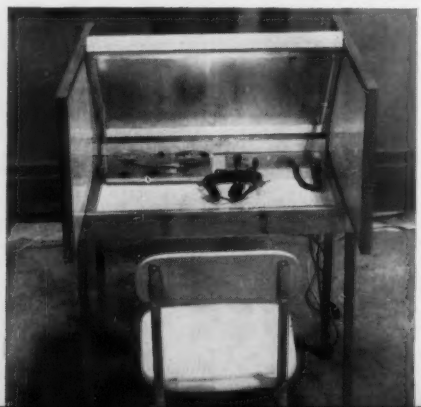
1 The student listens. "Recitations," testing, etc., are conducted in chorus or independently. This has been called *audio-passive* work; full potentialities of the equipment are seldom realized, and full value is not obtained.

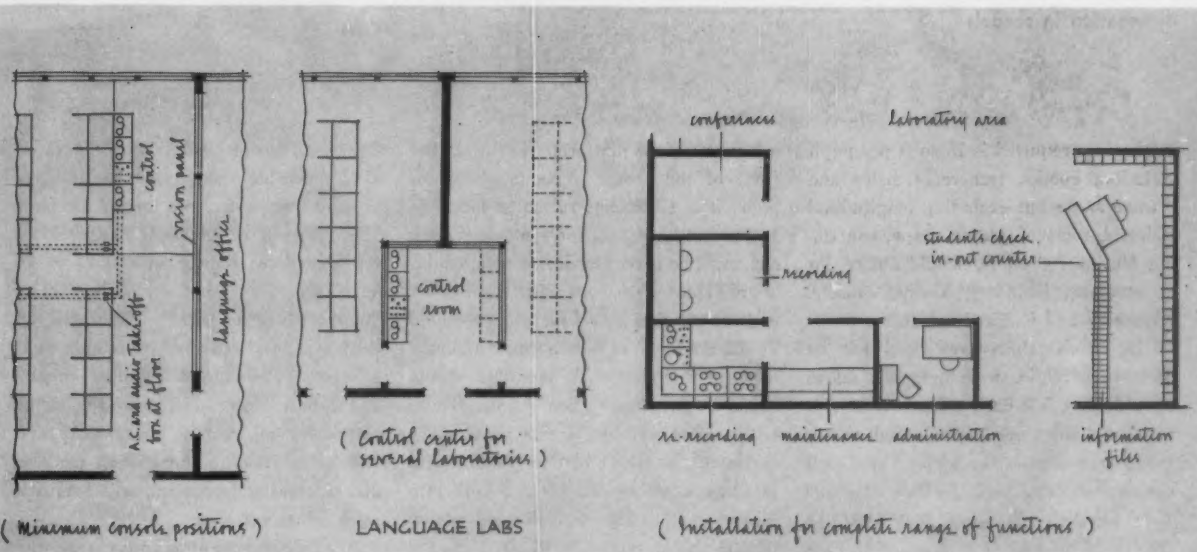
2 The student listens and hears his own voice; while there may be formal recitations, the student participates actively to a great degree. This has been called *audio-active* work; the equipment is slightly more complex; more nearly complete utilization is attainable.

3 The student listens, records, and compares his own voice with that on the teaching device; there is little necessity


booths all facing
recording and re-recording
monitor for visual instruction
opaque projector (portable)
monitor console
record or tape storage
6" high platform
screen
future wall tv
office and conference
projector
maintenance
film slide storage
A.C. and audio underfloor conduits, one connection per row of booths
record or tape storage desk and check-in
(Complete facilities - 28 student positions)
LANGUAGE LABS
A.C. and audio underfloor conduits, one connection per row of booths
platform 6" to 18" (check ceiling height)
one-way vision panel
roll-up screen
(language office) storage, maintenance, repairs, conferences, etc.
film or opaque projector (portable)
(Average installation - 32 student positions)

Language-laboratory plans (above) *for complete installations of the kind described in the text. Walls may be non-parallel to reduce reverberations, and booths may be placed in shallow arcs to improve vision. Different authorities give different names, such as "listening installation" or "electronic classroom" to facilities for the various gradations of utilization. Home-made booths in an elementary school* (below left); *commercially available booth* (right) *with front that folds down to become a desk top.*





LANGUAGE LABS

Elaborations on the auxiliary spaces which may be desirable, depending on the extent of the school's program, include a central control room and individual rooms or alcoves for all the accessory functions. When glass is used between rooms, it should be doubled to exclude noise, and doors should be made sound-tight. Every sound relating to the language being taught must be heard distinctly.

for recitations per se. This has been called *audio-active* work *plus evaluation*. Full utilization of audio equipment is attainable.

4 When visual equipment (ranging from chalkboard, corkboard, etc., through film, slide-film and TV facilities) is added, the functioning of a language laboratory may be substantially enhanced. Practicable wide-screen television, for example, is predicted. This and similar teaching aids may be too costly at present; but providing an appropriate arrangement of present equipment and small amount of necessary space for additional future installations is relatively inexpensive. Omitting such provisions may cause early obsolescence which, considering the total investment, could be costly indeed.

Equipment. For Type 3 or Type 4, each pupil-position requires a sound-conditioned booth containing a tape or disc drive ("record player") and earphones; a microphone for recording his own voice; and for each booth or row of booths, or both, a jack into which the teacher may plug his microphone and headset so he may listen in and instruct the individual student or a group. The simplest type requires only earphones.

The master console consists of one or more tapes or disc drives, a high-fidelity amplifier, and a multichannel control to permit channeling different programs to separate groups or individuals. It should also have a selector switch for instant change from recorded to living voice (microphone), or to phonograph, radio, or television. Greater usefulness results from including here equipment which will permit the teacher to listen in and communicate with any student, any one of several groups, or the entire class.

It will be seen that the range of equipment is from simple to fairly complex, and that the ultimate objective is the maximum of individual attention for each student, using instruments which the uninitiated might consider only as mass-communication devices. Whatever pieces of equipment are selected, the architectural problems remain much the same and the planning requirements can be simply stated.

Planning and Details. Close personal contact between teacher and pupils is highly desirable. Therefore, optimum class size is approximately 30 pupils, a figure which is a compromise: fewer pupils would permit better contact but would raise the cost per pupil-position to a prohibitive sum. Also, ideally, the master console is in the same room with the student booths. Having more than 30 pupil-positions per laboratory requires more than one teacher to observe facial movements, to operate controls and to give the desired individual attention; the presence, movement, and noise of more than one teacher disturb the class; consequently, a separate control room is needed. At times, cost considerations may require a glass-walled, central, console area to serve several language laboratory units; if so, some loss of personal contact must be accepted.

Within the room, the booths should all face in one direction, toward the instructor and the console, because the instructor watches facial movements as the student records; he communicates by microphone directly with an individual student or a group to correct errors seen as well as heard. Booths facing one direction also facilitate the use of visual aids. If they face in different directions, not only is it hard to use a movie screen, for example; but also, since the instructor cannot see all the students' faces from one position, he must either move around excessively and disturb the class, or accept "passive listening" as the most that can be accomplished.

The area required is 15 sq ft per pupil including booths, transverse aisles and console space but excluding longitudinal aisles. A room of proper shape, containing 600 to 700 sq ft, should suffice for 30 students, including booths, console, transverse and longitudinal aisles.

The booths themselves need not be more than 30 in. wide over all, set in rows at least 5 ft back-to-back. Each row may be divided into not more than two groups for economy of wiring; electrical connections run through two conduits (one for AC, one for audio) from the console to the end of each group in each row. A single tap from each conduit serves an entire group, since the desirable types of booths are designed to "plug in" to one another.

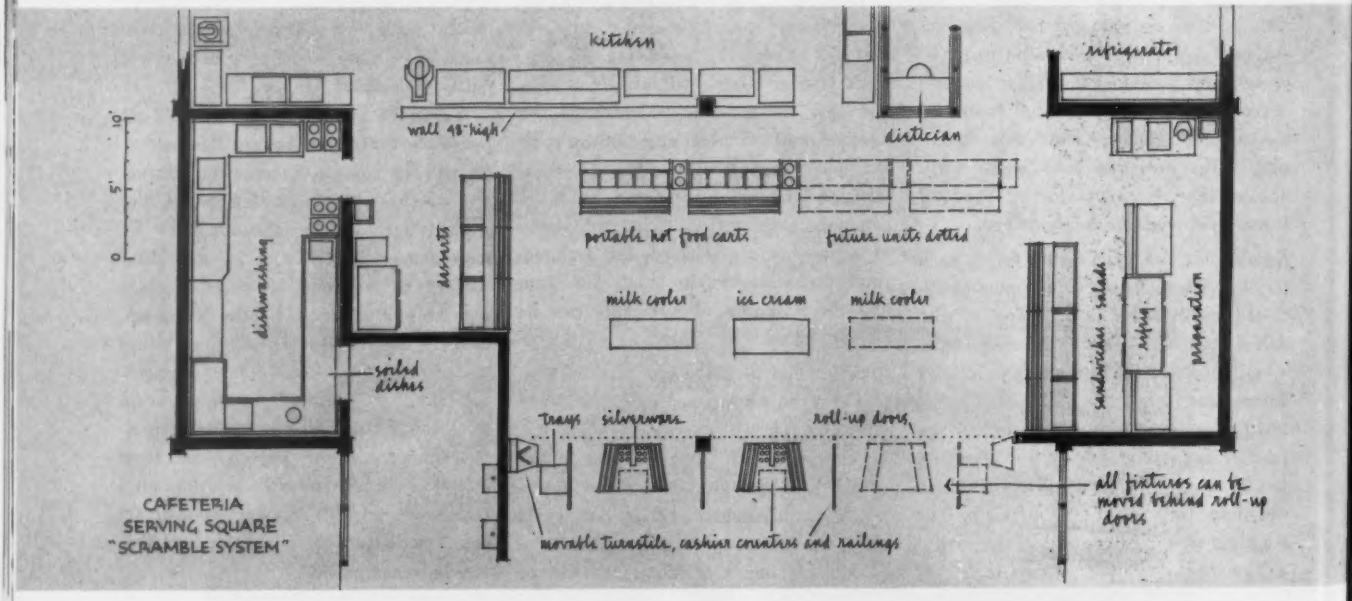
The booths, which preferably accommodate one student each, are somewhat like open-front telephone cubicles except that they are designed for sitting and have no tops. Whether they are custom-built or commercial products, their fronts should be no higher than 45 in., the maximum being set by sight-lines from an instructor's platform. This, at the front of the room, is commonly 6 in. high; it is sometimes raised as much as 18 in., but headroom for a movie screen, etc., must be maintained. A screen, chalkboard, charts, etc., set with the bottom edge 66 in. above the floor will be visible to all students in the normal arrangement of 30 booths. To facilitate vision, some booths have glass fronts. Those with vertical, sliding fronts usually are eventually adjusted to one position and left that way; not only is it a bother to move them, but also the noise and motion disturb the class.

The interior of the booth, above counter height, is acoustically lined. The counter should have space enough for heavy-duty tape and disc recorders (lighter "office" or portable models will not stand up under continuous use); at present, models employing vacuum tubes appear more satisfactory than those using transistors because ultra-high fidelity is desirable.

Related Facilities; Environment. There should be a place for projecting slides, film strips, movies, and opaque materials; it is desirable though not essential to provide a separate room for this purpose. There should be provision for a future wall-television receiver with a 36- to 42-in. screen. There should also be a place for recording on master tapes and for storing tapes; this also preferably is in a separate room and requires counter and cabinet space. If the school has an extended "self-teaching" program a tape-storage alcove with charge-desk facilities makes it easier for individual students to work by themselves.

Acoustic treatment and also ventilation of the entire laboratory need careful attention; in the recording room both are mandatory. Not only is quiet necessary for concentration and for accurate hearing; but also some heat is generated by electronic equipment. As to lighting, incandescent lamps interfere least with the audio equipment; with fluorescent lighting, shielded wiring, etc., may be required. In addition, the laboratory should be located in a part of the school far from noise, inside or outside.

Different ideas in school feeding: a "serving square" (below), as called the "scramble system," valuable when there are enough students and a choice of menus. Students enter through turnstiles controlled by a watcher who gages the square's capacity; there is no line-up; instead, the student gets a tray and proceeds directly to the counter containing his



kitchens

A few years ago, advice on school-kitchen planning and equipment layout was obtainable chiefly from equipment manufacturers; today, the kitchen consultant is a recognized professional. Yet the errors of omission and commission in kitchen design seem to increase, if one is to judge by the review of literally hundreds of plans. A statement of principles and requisites should clarify the problems, which are no more complex than those of any production-line operation.

Quite recently, some new ideas have been tried and found satisfactory in certain conditions. These may lead to further innovations. Like other machines used in schools, kitchen gadgets are expensive. There are several grades of quality; revising the specifications for one school cut the cost of this contract by approximately twenty-five percent. Considering that the cost of an average secondary school's kitchen equipment is well up into five figures—not including building construction, interior finishes or such incidental items as installing service lines, lighting, etc.—the savings that can be made are substantial. The successful innovations lead to economy as well as improved service.

The school kitchen must convert raw materials into meals and provide for serving them efficiently, safely, sanitarily, and without obtruding on the other aspects of the school plant. It must have access for deliveries; and the service drive and court should not constitute a traffic hazard. Its loading dock should be the correct height for a truck's tailgate. When raw foods and staples are brought in, they should be checked and stored; this means the dietician's desk or office should have a clear view of the service door, and that passage to storerooms, refrigerators, and freezers should be direct and unobstructed. There should be a further direct line of travel from storage to the various points of preparation: the cook's and baker's tables, vegetable-preparation sink, milk and ice cream coolers, and sandwich- and salad-preparation centers. Further still, the line of direct travel should proceed to range, oven, and steam kettle for foods to be cooked; and thence to the serving counter. All this may be stated simply: the school kitchen is a production line.

The serving counter should be simple and likewise direct, as short as the numbers to be served permits. Drinking water should be available not at the serving point, where it will slow service, but nearby. With this exception, all the necessary equipment should be closely organized in groups according to function —the oven handy to the baker, the salad refrigerator near the salad table, etc.— in order to economize on both food production time and such auxiliary costs as electrical service lines, range hoods, etc.

Safety and sanitation require, among other things, a hand-wash sink in the kitchen proper, under the eye of the dietician, even when there is a lavatory in the help's locker room or toilet. This may also serve for a cleaning sink in a minimum kitchen; otherwise, janitorial facilities are needed. There should be separate sinks and counters for vegetable

choice of food. Service is speedier than at a typical cafeteria counter. (Garinger High School, Charlotte, N.C.; A. G. Odell, Jr. & Associates, Architects) (below and overpage).

Food served to students from portable hot- and cold-food carts, to be eaten in classrooms. (Blue Creek Elementary School, No. Colonie, N.Y.; Henry Blatner, Architect).

preparation and pot-washing, the latter with, preferably, a grease trap. Floors and at least a high wainscot should resist grease penetration and be easily cleaned, which indicates a material such as quarry tile. The ceiling, to control noise, should be acoustically treated if a cleanable, non-absorbent material can be obtained. Equipment should have rolled counter and shelf edges, etc.; should have impervious work tops reinforced to prevent buckling and reduce noise; and should be designed with a minimum of bolt heads, crevices, etc., which might harbor pests. Aisles between major units should be at least 3½ ft wide, preferably 4 ft—more than this may be wasteful. The equipment should include fire extinguishers suitable to cope with grease fires.

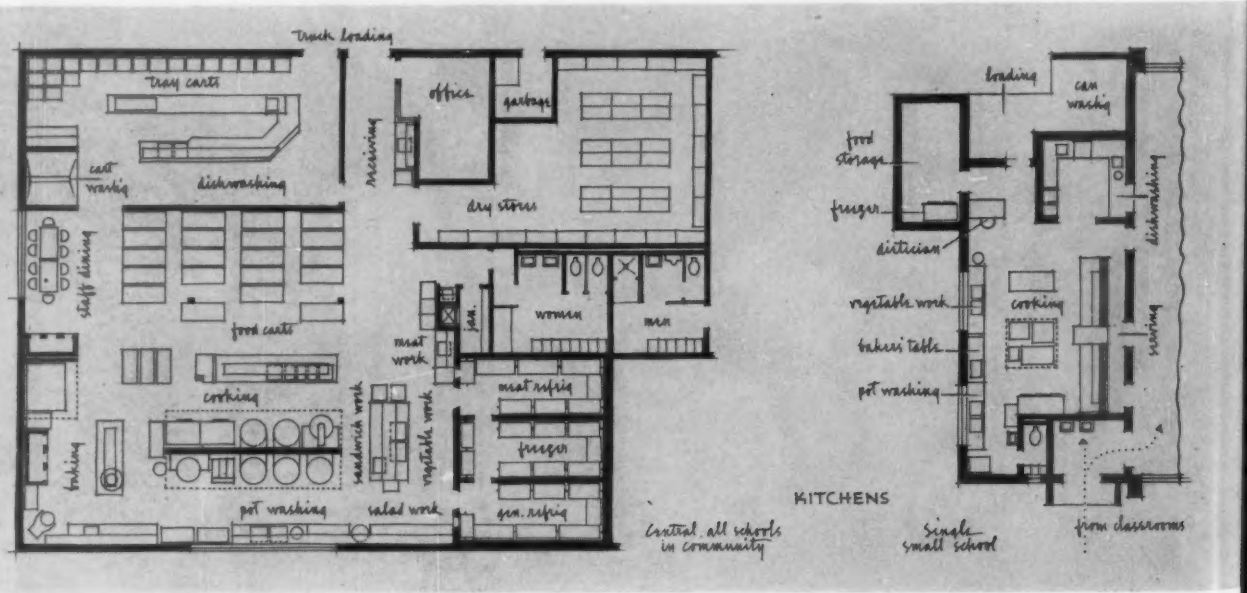
The dishwashing area should be enclosed with walls to the ceiling, to prevent steam and noise from invading the kitchen. It should have a pass window from the eating area, and a doorless exit, wide enough for a dish cart and a person, convenient to the serving line where the dishes are used. The sequence of operation is: scraping (which demands a garbage receptacle), prewash (a sink), dishwasher (with hood and independent exhaust fan), storage counter, and shelves. Other equipment includes a back-up counter on which unscraped dishes accumulate at peak periods, a grease trap, an auxiliary heater for high-temperature hot water (this can serve the kitchen also), and carts for transporting clean dishes and trays. All that is usually arranged in U-shape in a small enclosure.

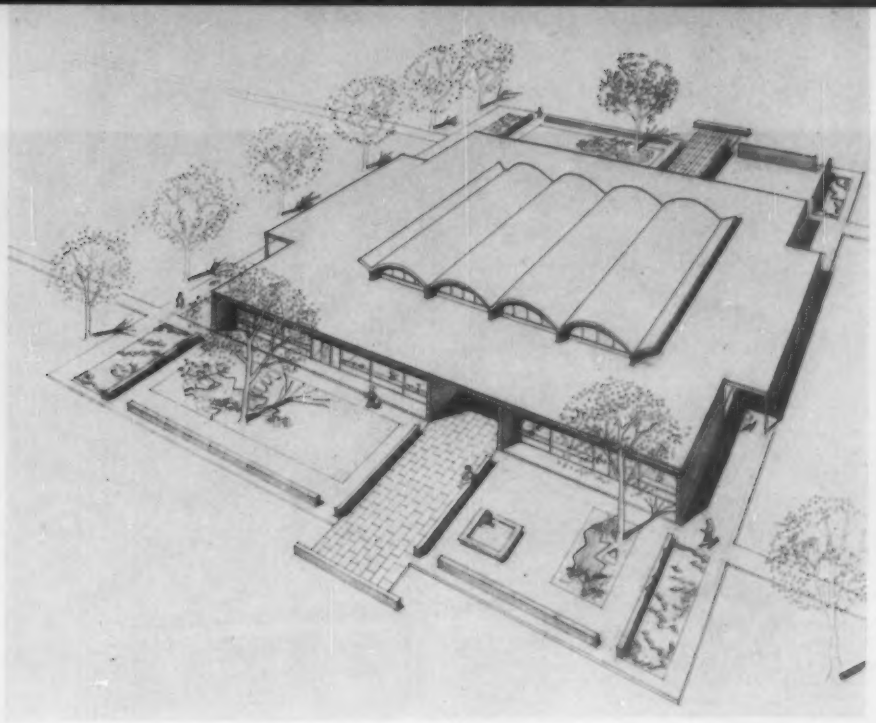
Garbage is best stored outside the kitchen, in a ventilated, screened alcove off the loading dock, where there are also facilities for washing the garbage cans.

Ventilation of the entire kitchen area is important. It should be positive; that is, it should tend to draw air from adjacent areas, not exhaust into them. Industrial-type heaters, mounted on or near the ceiling, are often used; the air stream from these should be directed away from the serving line so odors, etc., will not be disseminated. The ventilation exhaust, similarly, should be remote from any air intake.

Innovation and tradition: central kitchen (below left) *where meals are prepared for all schools in a city (Newark, Ohio, High School; Perkins & Will, Architects; Flambert & Flambert, Food Consultants). Note provisions for washing and storing hot- and cold-food carts. Special motor trucks with bodies sized to take carts may be used for transport to schools, where small serving pantries may be used or students may be served directly from the carts. Even in conventional cafeterias, use of prefabricated food carts, to replace custom-built serving counters, has been proposed.*

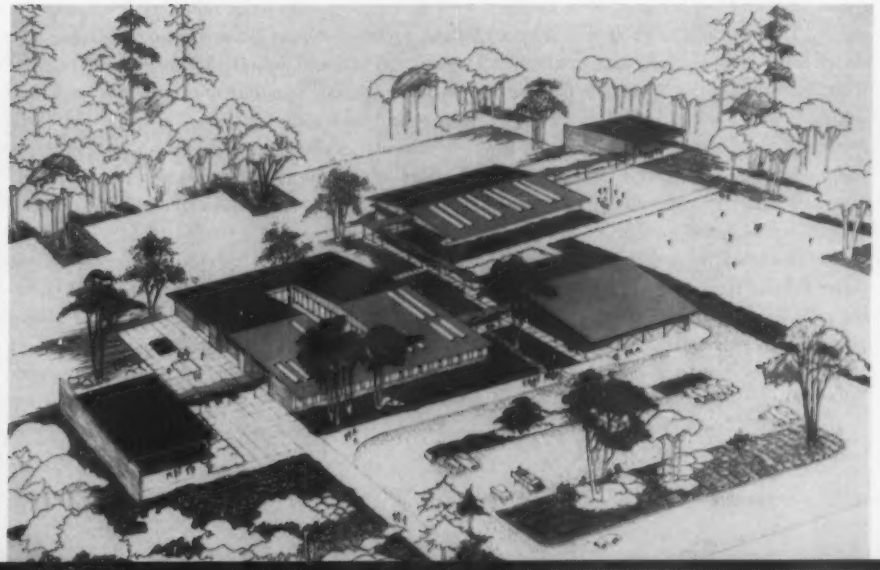
Minimum conventional kitchen (below right) *with all elements discussed in text (Tryon Hills Elementary School, Charlotte, N.C.; Biberstein, Bowles, Meacham & Reed, Architects).*





two elementary schools

Both of these are suburban elementary schools; one in Warson Woods, near St. Louis; the other in Mercer Island, near Seattle. The climate is mild in both places, although where St. Louis is sometimes humid, Seattle is often quite damp. Both schools have a warm-air system which heats the floors as well as heating and ventilating the classrooms; both are equisitely detailed, carefully planned; they are not monuments; familiar materials are used in both; both have a custom-made kitchen and unusual provisions for dining. More than all this, though, both possess qualities which it is hard to put a name to: they are happy schools.



Photos: Ezra Stoller

Warson Woods School

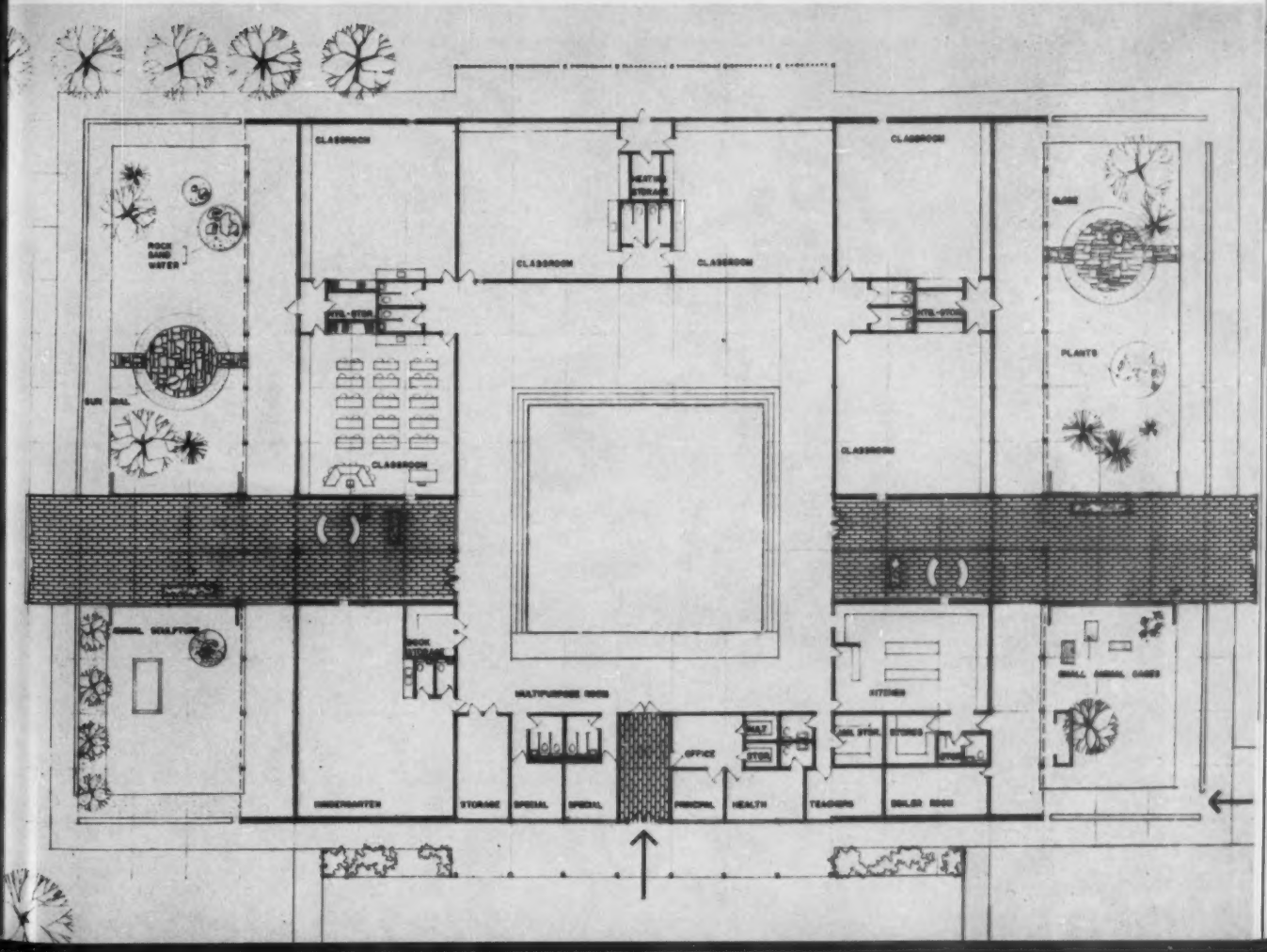
location	Warson Woods, Missouri
architect	Hellmuth, Obata & Kassabaum
associate architect	Caudill, Rowlett & Scott
engineer	Smith, Hanlon, Zurheide & Levy
general contractor	George L. Cousins Company

Although few children appear in these photographs—was the photographer or the season to blame?—this is a most human school. That it contains no more than six classrooms, kindergarten, and multipurpose room plus the essential facilities helps; but even so it might have been a routine design. Grouping the rooms in pairs enclosing the central multipurpose area has been tried before, and so has the sunken forum in the middle.

One could say the same of the brightly colored doors from each classroom pair to the exterior; of the small room toilets, appropriate for elementary grades, compared to aggressively sanitary and monumental gang toilets; about the glass walls protected from the sun by covered outdoor ways. One could discuss its almost nonexistent corridors, emphasize that very few of the square feet paid for are not educationally useful, and wonder whether the necessarily intimate mingling of classes and ages which the plan fosters is, as some educational idealists profess, an aid to democratic learning or, as some less imaginative administrators aver, a headache.

In spite of the dull rows in which empty desks was placed when the school was photographed, one could speculate on what happened when the kids moved in and the place got to humming, on whether the school board finally found the money to equip the limited outdoor space as creatively as the architects hoped, and on the many refinements of detail, the coat-hanging alcoves and cupboards and doors located and aligned economically and exactly right without being fussy (except that it would take a 7½-foot teacher to reach the topmost cupboard). One could find that its floors are warm because forced warm air from several small furnaces is ducted under them to linear registers in the window sills, where it becomes ventilation as well as warmth.

But this small school is more than the sum of these small parts. What more it is, you may name for yourself. It is a third-grader who calls it "a happy place."


CLASSROOM
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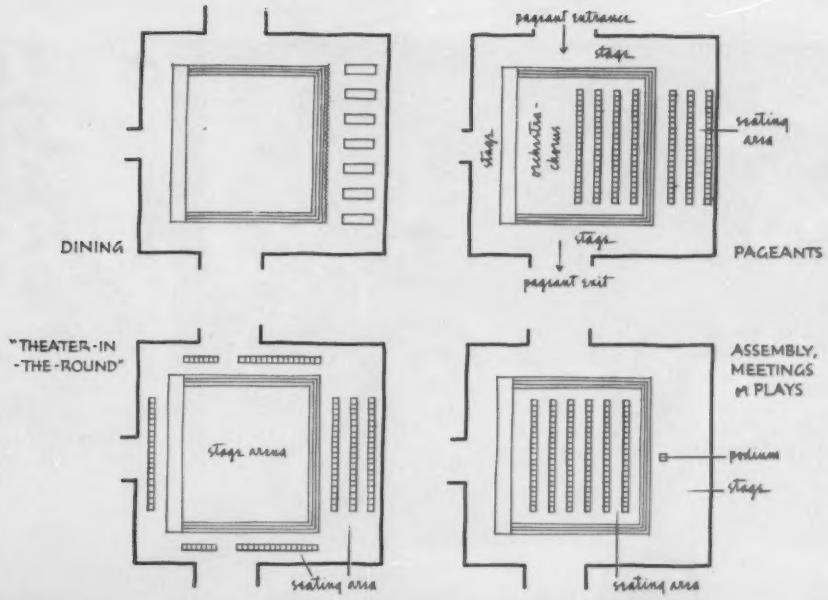
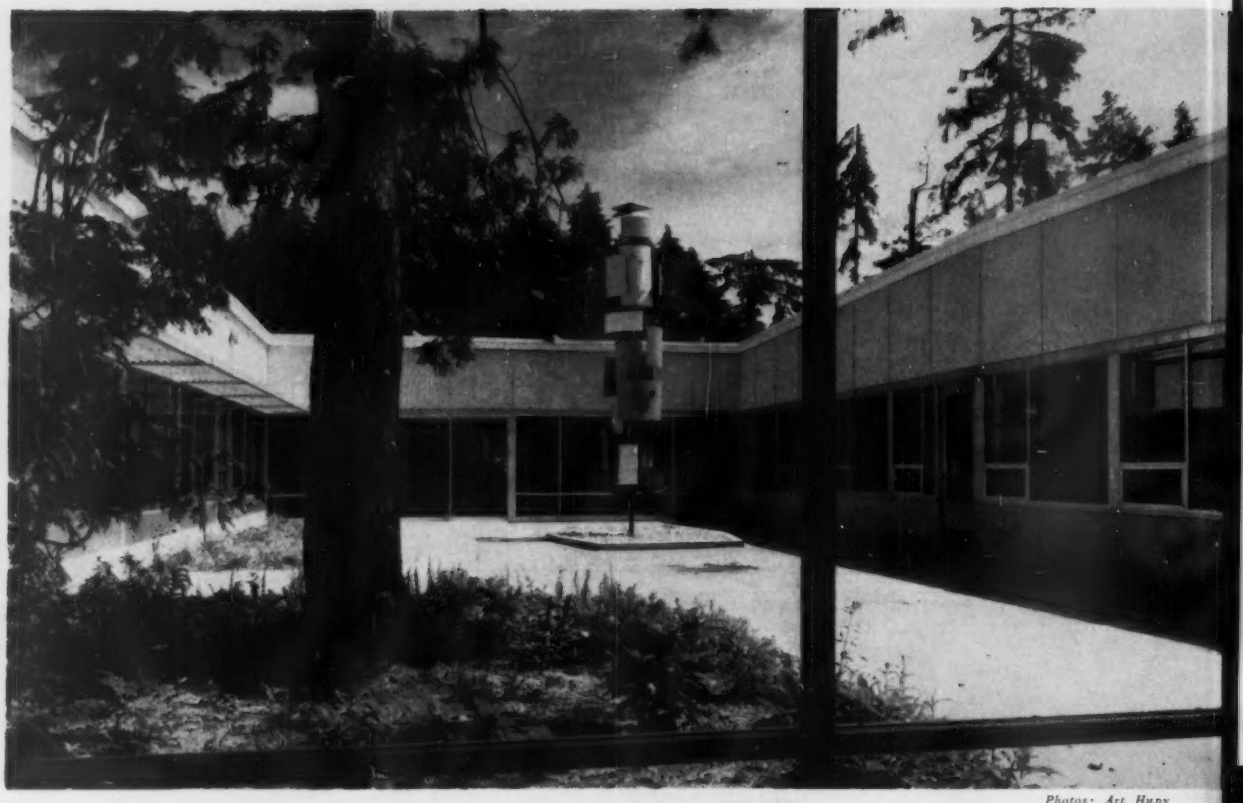
CLASSROOM
ROCK AND WATER
SUN DIAL
GAME
PLANTS
SMALL SCULPTURE
ROCK STORAGE
MULTIPURPOSE ROOM
KITCHEN
SMALL ANIMAL CAGES
KINDERGARTEN
STORAGE
SPECIAL
SPECIAL
OFFICE
PRINCIPAL
HEALTH
TEACHERS
BOILER ROOM

The central room of Warson Woods Elementary School, roofed with a series of wooden lamella vaults, serves during the day as gymnasium, auditorium, playroom, dining room, project area, and display area. After hours, it is a community facility. Along the main girders are plug-in strips, to accommodate whatever lighting fixtures are desired, as well as curtain tracks. Some arrangements are suggested by the sketch plans. To appreciate it fully, one should see children sitting on its steps, walking on errands down the side aisles, using the ramp, playing, working, engaged in the great experience of becoming part of a world larger than their home or classroom.


DINING
pageant entrance
stage
orchestra - chorus
seating area
stage
stage
pageant exit
PAGEANTS
"THEATER-IN -THE-ROUND"
stage arena
seating area
ASSEMBLY, MEETINGS & PLAYS
podium
stage
seating area



Photos: Art Hupy

Island Park School

location	Mercer Island, Washington
architect	Bassetti & Morse
structural engineer	S. Ivarsson
mechanical engineer	Stern & Towne
electrical engineer	Beverly A. Travis
general contractor	E. F. Shuck Construction Co.

Many of the characteristics of the preceding school are apparent in this one as well, although this, in its initial stage, is twice as large. There are 12 classrooms, for 360 pupils; when the additional wing is built it will house 600. The covered play areas, desirable in the climate, are also to be erected in the future.

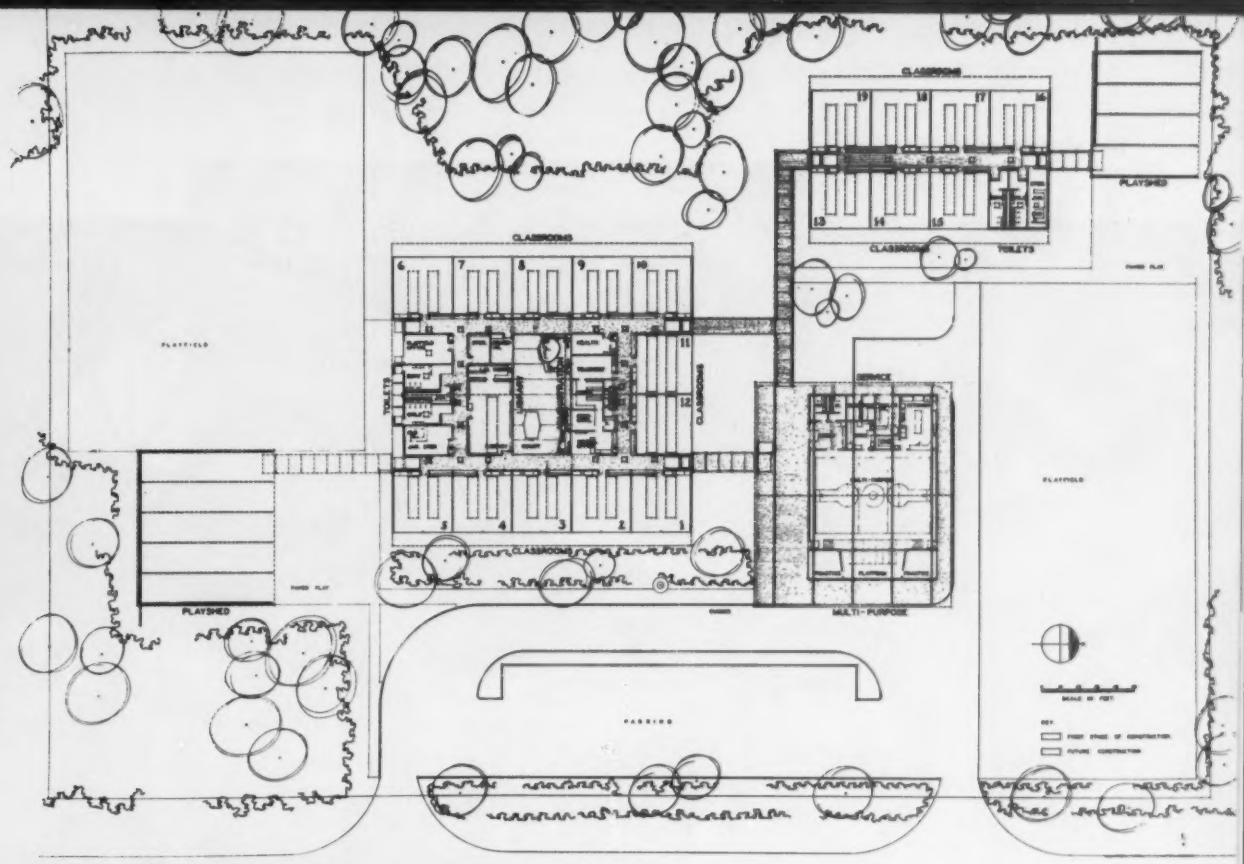
The school adjoins an undeveloped 40-acre county park, concerning which there are informal agreements on co-operative use; therefore the toilets open to the exterior for park use and the playfield office will be used by park personnel. Park users will be able to use the multipurpose building and the school will use the park's playfields.

The school staff desired a closely knit first unit in which each room would be adaptable to any age group; in other words, they asked for easy supervision and communication, and for flexibility in room use. Among their postulates were directness, simplicity, attractiveness, and practical materials; in each room an area dark enough for visual aids; a library which would be a focal point for all; and preservation of trees. Nearly all children arrive by bus, hence the large bus-loading area.

The construction materials are conventional: lightweight, reinforced, block walls, painted inside and out; concrete slab on grade; welded-steel frame and bar joists; built-up roofing over acoustical-steel decking on the classroom building, and over wood plank on the multipurpose room; aluminum windows, asphalt-tile floor covering (ceramic in toilets).

These ingredients also appear in school after school, but too often with results not nearly so happy. Great care has been taken with detailing and assembly. The architect finds satisfaction in the family spirit generated by the closely organized classroom building; using different, perhaps more adult words, he finds the same manifestation as the third-grader previously quoted.

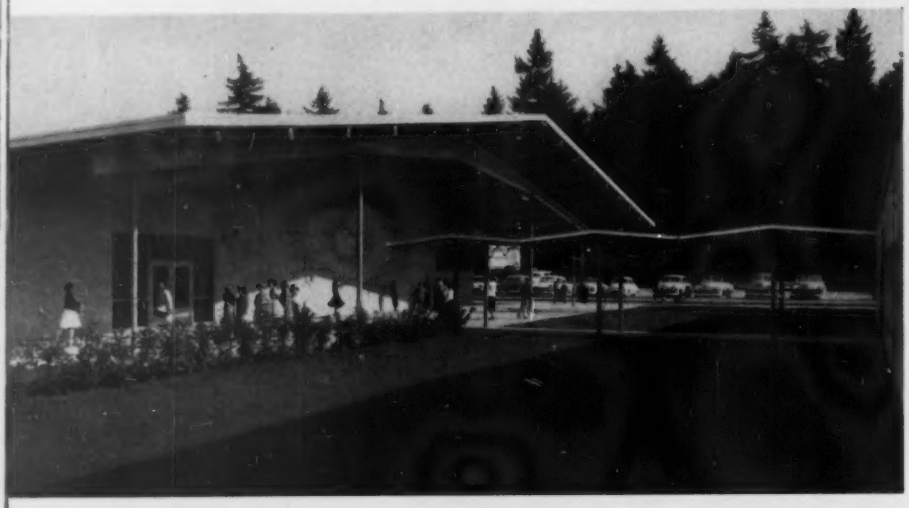
This is no accident!


CLASSROOMS
PLAYSHED
CLASSROOMS
TOILETS
PLAYFIELD
CLASSROOMS
CLASSROOMS
PLAYSHED
MULTI-PURPOSE
PLAYFIELD
PARKING

In the classroom building, exposed ceiling construction is painted white, walls harmonize with the solid-color floors; the exterior is light gray and white. Classroom storage-and-display unit (left). *In this building, heating is also provided by forced warm air ducted under the floors to window registers.*

Evidence of careful detailing is visible (below) *in corridor coat-hanging alcoves, designed for the moist climate; recessed classroom doors* (right) *which do not obstruct corridors; and in all construction as shown, looking toward the classroom court* (above). *In this is a welded-steel sculpture* (see photo on page 150), *a gift of the artist, C. W. Smith, and the architect. Children like its bright enamels.*

The multipurpose building at Island Park School serves adults and others who use the adjoining park, as well as the occupants of the school. Here the exposed ceiling construction is painted pink.



Among other services, this unit houses the main boiler room, whence hot water is delivered to the classroom building, and through a heat exchanger, provides warm air. Also included here is the kitchen: food is placed in carts and wheeled to the classroom building; the children eat in their rooms. This eliminates the pressure and noise created by feeding children in masses; it reduces serving costs; and it requires classroom teachers to oversee eating as well as learning.

has school air conditioning arrived?

by Henry Wright*

Pioneer experiences at Alton, Illinois, indicate that air conditioning for schools is there to stay. Curiously, however, progress toward the 12-month school was almost accidental in that city. Here, the author describes how Alton came to have its first air-conditioned school and reveals subsequent factors that have led him to predict that it will never have another without it.

Alton, Illinois (20 miles above St. Louis and also on the Mississippi) has one of the few air-conditioned public schools in the middle part of the U.S., and is building another. Architecturally, neither school is highly significant, but the fact that Alton, having experienced school air conditioning will in all probability never build another school without it, is highly important. So, too, is the fact that this experience has already produced distinct design changes in the school now under construction and may lead to more in future buildings.

The basic reason why Alton will probably go on building air-conditioned schools and actually *has* gone on to build a second one is easily stated. Already, the school district is getting more use out of its first air-conditioned school than any of its 28 other school buildings —an additional seven weeks of capacity operation. This means that Eunice Smith School, which is operated as an elementary school during the regular school year and as a summer school subsequently, is being used at peak efficiency—about 20 percent more than most school buildings. And since Alton has found that air conditioning adds less than 5 percent to the cost of a new school, such summer use looks like a real educational bargain.

Like most communities, Alton has had "summer school" for the past 20 years, with increasing emphasis on "enrichment" courses for high-school students, remedial reading courses for those in elementary school, etc. Without air conditioning, the greatest number enrolled was less than 200, and classes often had to meet in the early morning, late in the evening, or out of doors to "beat the heat" (which never really admitted defeat). In the second year of air-conditioned operation at Eunice Smith, more than 400 students were enrolled in summer programs. Of this total, a majority were high-school students taking "enrichment" courses preparatory to college or technical schools, a few were high-school students with "make-up" problems, and almost 100 were elementary-school children acquiring improved reading habits. All paid tuition for this special summer instruction.

By this use of new, air-conditioned space, Alton seems to have conjured away two obstructions to educational progress—the one which is believed to preclude more nearly full-time use of our educational plant—established vacation habits—and the one which cautious school officials feel is an obstacle to the air conditioning of new school facilities—"What would you do about all the schools that *aren't* air conditioned, especially the newer ones?"

Like many a workable solution of a complicated problem, the initiation of this piecemeal—but very real—progress toward the 12-month school was almost accidental. Eunice Smith School was planned to serve, in half its classrooms, the special needs of physically handicapped children. In the use of these facilities, it was felt that the handicapped children should have the opportunity to attend school an extra month, to enable them more readily to keep abreast of their age groups. In actuality, this has not worked out exactly as planned—the disposition of the handicapped children to prefer regular classes having been greater than was supposed. But the plan did lead to summer air conditioning, and to a contribution of $12,500 by a public-spirited Altonian to cover the cost of adding air conditioning to the Eunice Smith School building program. And, as the program for summertime orthopedic classes tended to shrink (last summer there was only one such class), the increased popularity of the summer school more than took up the slack, with even the all-purpose room taken over for a class in typewriting.

design changes

By the time the next Alton school was under consideration—Gilson Brown School—this process had progressed so that the school board was beginning to think of a 12-month operation as a future possibility, and further expansion of the summer school as an immediate probability. The architects selected for the project, Keeney & Stolze, were instructed to proceed on the basis of providing year 'round air conditioning, despite the fact that this had not been contemplated in setting up the bond issue for the school.

With the provision of air conditioning almost a certainty, Keeney & Stolze decided on a north-south orientation for the classrooms, to minimize solar heat gain. They developed a cross-section employing north-facing clerestory windows to provide daylight in the central corridor, and borrowed daylight for the part of the classrooms furthest from the window walls. (In Eunice Smith School, which faced east and west, these needs had been met by plastic-dome skylights over the corridor, and glass-block toplights in the classrooms). Generous overhangs were provided for both north and south windows, to control direct sunshine and sky glare, and the roof was surfaced with white-marble chips to reflect solar heat.

Bids were taken for the building with provision for *future* air conditioning (i.e., air-conditioning-type unit ventilators, insulated piping, space in the boiler room for water chiller, etc.) and for the air-conditioning system complete with chiller, water tower, and controls. On

* *Consultant on Building Product Research, New York, N. Y.*

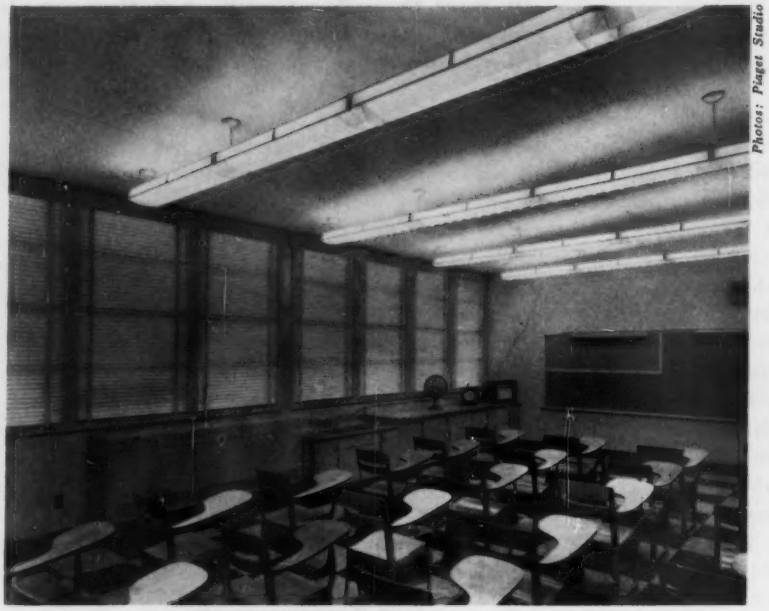
the basis of actual bid prices, *completion* of the air conditioning amounted to $.50 per sq ft in the 7960 sq ft building. The provisions for future air conditioning included in the base bid were estimated by the architects to cost $.20 per sq ft, making the total air-conditioning cost —over and above that of heating and ventilating—$.70 per sq ft. In the light of the experience at Eunice Smith, the school board decided to go ahead with air conditioning, especially since the total cost of the school ($14.44 per sq ft, including air conditioning and site improvements) was low enough to provide two classrooms more than programed.

Because of the precautions taken in the design to minimize heat gain, Gilson Brown School—with 13 classrooms, two kindergartens, and a multipurpose room —required only 75 hp of chiller capacity. These changes should also be reflected in lowered operating cost, which, at the somewhat smaller Eunice Smith School, runs about $10 a day in mid-summer.

future possibilities

Superintendent Johnson of Alton School District is a convinced proponent of the 12-month school program. He admits that he has not yet sold it to the people of his community, the school board, or even his staff, but he believes that Alton could save three or four million dollars over the next 10 years by changing to 12-month operation and that people will eventually realize this. In fact, he has a way of putting the possibility that is not likely to be too popular with architects: "If we would air condition all our schools, I don't think we would have to build another one for 10 years at least —and believe me, that would be saving money!"

Full of dynamite as this thought is for the average taxpayer, it seems much more likely that Alton will move in this direction by going on building air-conditioned schools and expanding its summer education program, along whatever lines attract the most interest and support. Thus, what is happening in Alton at present is not calculated to reduce the total expenditure for education, but to provide more education, more efficiently, to meet a real demand. And, it seems more than likely that with the increased difficulty that high-school graduates are experiencing in gaining admittance to the colleges of their choice, community support for *this* kind of a program, with its need for more and better school facilities, will be forthcoming in Alton and elsewhere. If, within such a program, Superintendent Johnson finds it possible to initiate gradually some sort of staggered vacation arrangement that relieves somewhat the pressure for new buildings—and he is probably ingenious enough to do so



Photos: Piaget Studio

Built in 1957, the 12-room Eunice Smith School (above) *was among the first in the mid-west to have summer air conditioning. Cost of air conditioning runs about $10 per day in mid-summer.*

North-south orientation of classrooms in Gilson Brown School, being constructed in Alton (acrosspage), *minimizes solar-heat gain. Cross-section shows use of clerestory above built-in lockers to light corridor. White-marble-chip roof surface further reduces air-conditioning load. Keeney & Stolze, Architects.*

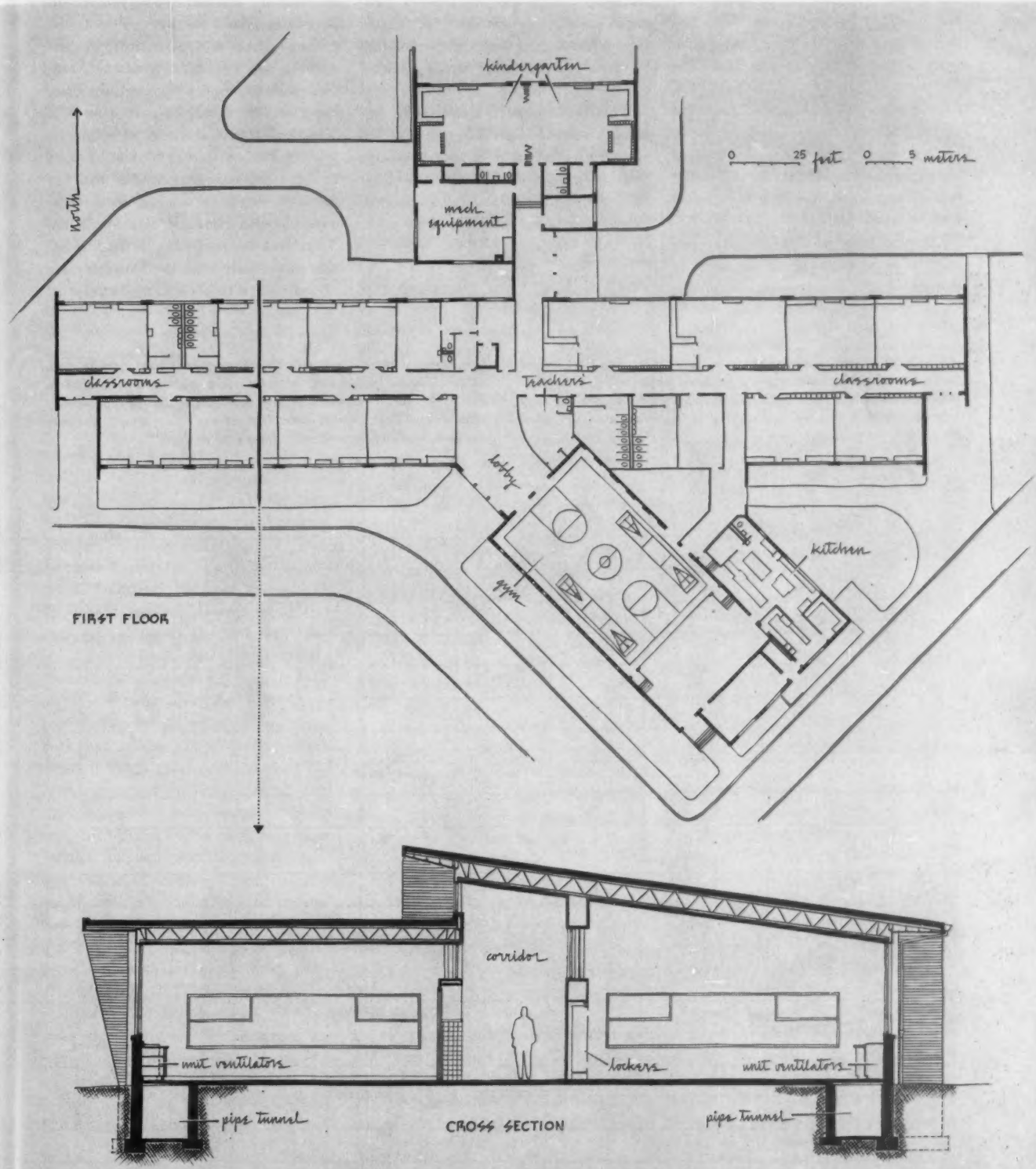
Corridors in this school (below) *are lighted by plastic-dome sky-lights with diffusing panels in the suspended ceiling. As a result, officials point out, electric lights are seldom needed. Albert M. Goedde & Associates, Architects and Engineers.*

—this may save money, over-all. But the principal significance of Alton's new air-conditioned schools will probably remain that of providing more take-home learning with greater efficiency—if only because it costs so much more, in most cases, to add air conditioning to old buildings than to include it in new ones.

field research arrangement

In addition to providing what amounts to an experiment in educational technique, the inclusion of air conditioning in Eunice Smith School provided a ready-laboratory for the manufacturer of the air-conditioning equipment[1] to learn

[1] *Herman Nelson School Air Systems Division of the American Air Filter Company.*



materials and methods

about its performance in a type of use with which there was little experience.

Eunice Smith School, it should be remembered, was finished in 1957. At that time, the manuafcturer had already had a school air conditioner on the market for three or four years, developed primarily to meet the need for schoolroom ventilation in mild-climate areas—the southern part of the U.S. By 1958, this company had developed an improved air-conditioning unit ventilator for use in northern areas, and wanted to compare its performance with that of the earlier type of unit which had been installed in Eunice Smith School.

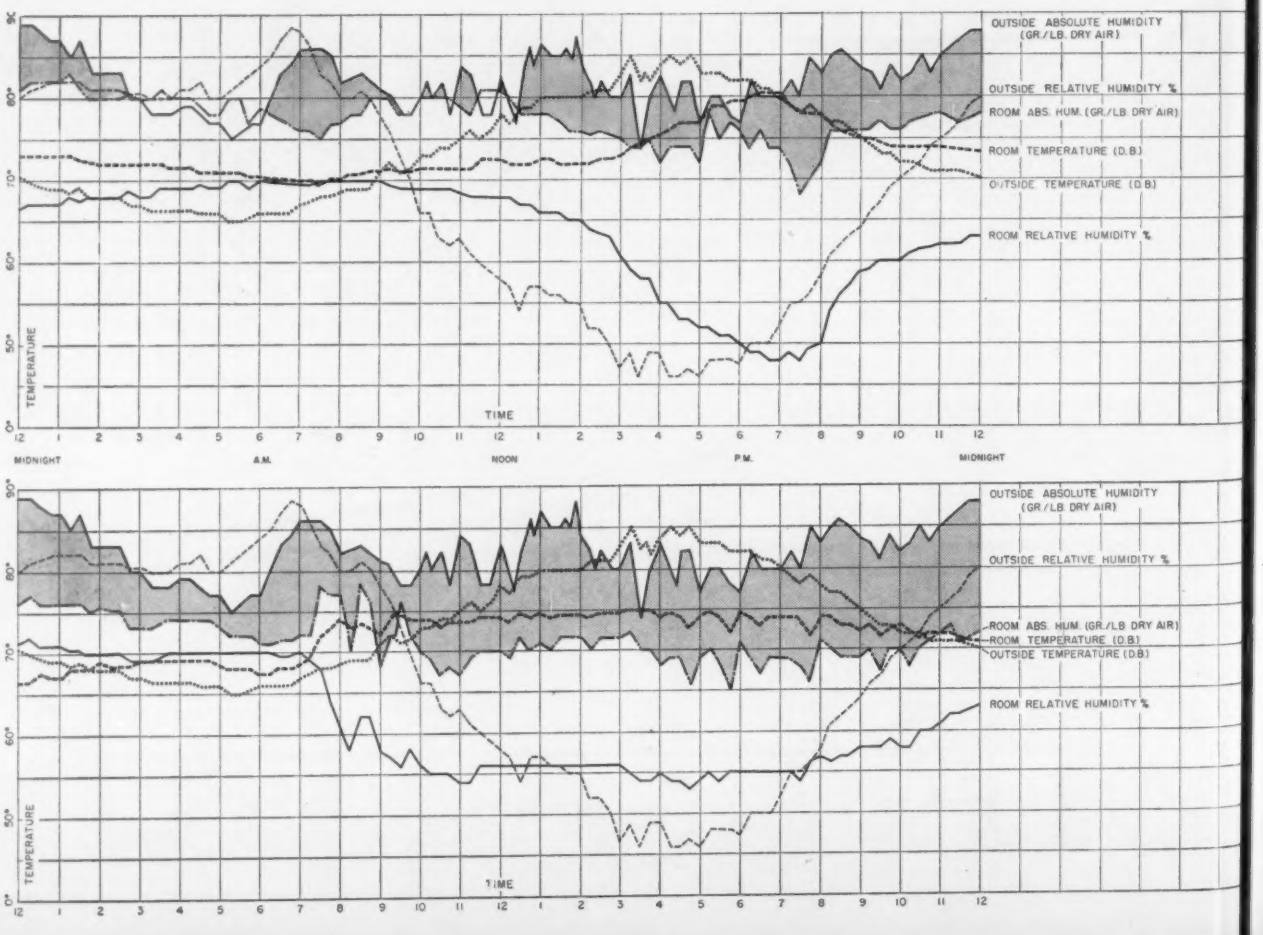
School officials gave the company permission to replace one of the units in the school with the new variety, so that comparisons could be made between results in similar classrooms under actual operating conditions. Old hands at conducting searching investigations of heating and ventilation in occupied school buildings,[2] these researchers installed recorders, strung a mile or so of thermocouple wire around the building, rearranged piping, and developed a technique for scooting through pipe tunnels from point-to-point beneath the building by going "bellybuster" on a wheeled cart.

What they wished to demonstrate, primarily, was the improved control of humidity achieved by their new unit[3] over their older equipment.[4] In the older unit, the cooling effect was modulated, in response to the demands of the room thermostat, by the opening and closing of a valve controling the flow of chilled water through the cooling coil. This meant that, at times when the cooling load was not very great, the cooling coil tended to become gradually warmer and to have less and less dehumidifying effect, even though the need for dehumidification, at such times, might still be considerable. In the new unit, the cooling effect was modulated by the opening and closing of a *damper*, controling the flow of *air* through the cooling coil ("face and by-pass control"). This meant that at times of minimum cooling, the coil remained just as cold, or actually somewhat colder than in times of maximum cooling, so that dehumidification remained at a maximum. There was no possibility of re-evaporation of moisture from the finned surface of the coil, with a resulting increase in

[2] JANUARY, 1956 P/A.
[3, 4] HerNel Cool II *and* Amervent, *respectively.*

As 24-hr record shows (below), *valve-controlled cooling unit proved to be less effective dehumidifier than later model tested. Gray tone indicates amount of dehumidification accomplished; relative-humidity line reveals that unit did not succeed in lowering humidity below 60 percent until after 3 p.m.*

Gray tone (bottom) *indicates that damper-controlled cooling unit, with continuously-cold coil, provided more consistent dehumidification. This unit reduced classroom humidity to 55 percent shortly after 9 a.m. Both records were kept on same day, which was very hot and humidity control was difficult to achieve.*



relative humidity and the likelihood of odor problems. The advantages of this type of control were fairly well known in large, central systems of the better type, but their realization along with the advantages of unitary, room-by-room air conditioning and wintertime ventilation cooling—so important in the school field—were practically unknown until the type of air-conditioning unit ventilator being tested was developed.

At the same time, the researchers hoped to accumulate information of value to school air-conditioning engineers and school architects, by comparing the various components of the actual cooling load found in the building under outdoor "design" conditions with the theoretical assumptions on which the sizing of the equipment was based. It was felt that in this way reliable guidelines might be laid down for architects of future air-conditioned schools, by showing the relative importance of precautions taken to avoid excessive heat gain.

research findings

As an accompanying chart shows, the expected improvement in humidity control due to "face and by-pass" control was fully documented by the tests. Analysis of the heat gain components, however, was complicated by a factor which the researchers had not anticipated. It turned out to be the practice of Donald A. Keil, the school district engineer, to operate the air conditioning at Eunice Smith School continuously, rather than to shut the system down at night and over weekends. This had a striking, unanticipated effect on actual peak load on the air-conditioning equipment: it was a great deal less than had been assumed on the basis of regular air-conditioning design procedures. Where such procedures indicated a peak load for the fully-occupied east-facing classrooms of 45,800 Btu's per hour, the maximum cooling actually done in an east-facing room on a day corresponding to the "design day" was less than 20,000—or only 43 percent of the design load.

The striking difference between the anticipated and actual loading in this room—as determined by measuring the amount of cold water flowing through the unit and its rise in temperature—was apparently due to the "flywheel effect" provided by the mass of the building, which tended to cool to below 70 F at night and then gradually rise in temperature during the daytime, absorbing a great deal of heat. Especially in the east-facing rooms, this tended largely to eliminate the theoretical peak load due to direct sunshine on the windows, since this happened early in the morning when the rooms were just beginning to warm up. (The researchers had done nothing to correct the tendency, which seems to be standard wherever air conditioning is first being used, to set the thermostats down and "keep the system working," on the theory that if a little cooling is a good thing, lots of cooling must be better.)

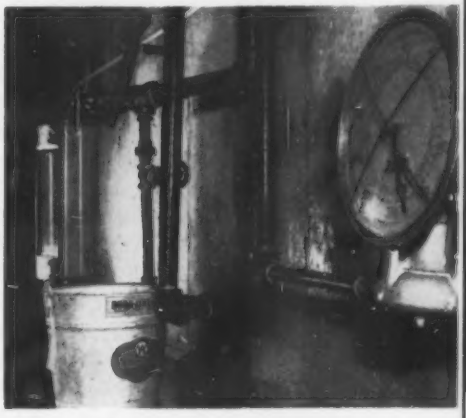
Testing was not possible in the west classrooms on the same basis as in those facing east, since these rooms were not ordinarily occupied in the afternoon. However, it was apparent that much the same thing would have been true of the actual vs. theoretical load on that side of the building as was true on the east, since this part remained at almost night-time temperature throughout the morning and did not begin to warm up until afternoon.

While deliberate advantage is sometimes taken on this "flywheel effect" in sizing air-conditioning equipment in developers' houses, it is questionable whether this would be a good practice to follow in school buildings. Here somewhat more refined comfort standards are likely to assert themselves as teachers and pupils become more accustomed to summer cooling; and overcooling, which is essential to the realization of "flywheel" action, may be frowned upon. Probably the best answer is the one provided by Engineer Keil, who is glad that the cooling plant at Eunice Smith seems to be about 50 percent oversize. "Why, I can add at least six rooms to that school any time I want, without changing a thing!" he asserts. From the research findings, he could do so tomorrow and no one would even notice the difference.

conclusion

In a number of ways, Alton's pioneer experience with school air conditioning may be pointing the way for the rest of the country: (1) by showing how the typical community can make immediate use of air-conditioned educational space and thus increase the efficiency with which educational facilities are utilized; (2) by showing how little air conditioning of new school buildings adds to their total cost (less than 5 percent, in the case of Gilson Brown); (3) by showing that air-conditioned school facilities are not expensive to operate (less than $1.00 per classroom day, in hottest weather); (4) by showing how the first cost of air conditioning can be further reduced, in the case of schools, by thoughtful design and also by continuous operation of the air-conditioning plant. This is pretty much what has happened in one medium-size town as a result of what was largely an accident—but possibly a very fortunate accident for the Alton School District and for other school districts throughout the country that are able to learn from it.

Calibration check on "directional thermopile" (above). *Recorder in right background shows 32 F as thermopile is pointed at block of ice. Clocklike recorder is for room temperature and relative humidity. Water and flow meters were installed in pipe tunnel under three classrooms to register exact amount of "work" done by air-conditioning unit ventilators* (below). *Bucket collects condensate to determine proportion of cooling needed due to latent load and sensible load.*



acousto-electronic auditorium

by Harry F. Olson*

Too often, little attention is given to application of a sound system in a room or auditorium, when in the design stage; later, provision of the sound system results in one unco-ordinated with acoustics and architecture of its enclosure. Described here is an acousto-electronic auditorium which was designed as a part of RCA Laboratories in Princeton, New Jersey.

Sound-reinforcing systems are almost universally employed for reinforcing speech and music in all types of rooms and auditoriums. It has been established that these systems are an absolute requirement for overcoming the inadequate acoustical characteristics of the enclosures. For example, in the case of large auditoriums, sound-reinforcing systems are necessary because the speech power of the speaker is inadequate to provide a satisfactory listening level. In the case of small rooms, sound reinforcing is required to override the high ambient-noise level and excessive reverberation time. In general, very little consideration is given to the application of sound systems in rooms and auditoriums when the structures are in the design stage. The usual procedure (although undesirable) is to design and build the structure and, then, suddenly find that the acoustics of the enclosure require the addition of a sound-reinforcing system. As a consequence, the provision of the sound system becomes a crash project, and the resulting system is unco-ordinated with the acoustics and architecture of the enclosure. The over-all performance is less satisfactory than would have been the case had the design of all elements of the acoustical project been planned together. From the foregoing, it is evident that the logical procedure is to design the auditorium and its sound-reinforcing apparatus as an integrated system. When this is done, the acoustics of the electronic sound system are correlated with the acoustics of the enclosure. The system which results from this procedure may be termed an acousto-electronic one. It is the purpose of this paper to describe an acousto-electronic auditorium that has been designed as a part of RCA Laboratories of Princeton, N.J.

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general considerations

The utilitarian specifications describing an auditorium for RCA Laboratories were as follows: a seating area of 2000 sq ft for a seating capacity of 300 persons on nonfixed collapsible chairs, and a stage with dimensions of 42 ft in width and 13 ft in depth. In order to conserve space and reduce cost, it was desirable to confine the height of the auditorium to 11 ft. Satisfactory sound level over the entire audience area can only be obtained in an auditorium with this low height when a sound-reinforcing system is employed. A particular specification called for a sound pick-up system which would not require the wearing of a personal microphone. It was also decided that all of the electro-acoustic elements should be concealed from view. Furthermore, the performance of the sound system should be such that it would provide natural sound reproduction from the standpoints of sound level, frequency range, and sound distribution. A further requirement was that the sound system should perform without a human monitor in attendance.

The shape, dimensions, acoustics, and electronics of an acousto-electronic auditorium satisfying the specifications and requirements outlined above are shown (*Figure 1*). Sound treatment is provided on all walls and ceiling. The stage floor is carpeted for sound absorption and footstep-noise reduction. The sound absorption was selected so that a reverberation time of .6 sec in the mid-frequency range would be obtained. This amount of sound absorption provides adequate ratios of direct to reflected sound, both at the microphones for the original sound and at the listener for the sound reproduced by the loudspeakers. Six microphones are located behind a perforated ceiling to pick up the sound from the speaker at any location on the stage. Twenty loudspeakers are located behind perforated sections of the ceiling to provide reproduced sound coverage of the audience area. A delay system is introduced between the microphones and loudspeakers in the auditorium to provide improved intelligibility and the illusion of realism in reproduced sound. Loudspeakers are also provided backstage and in the control room. Details of the acousto-electronic auditorium will be described in the sections that follow.

acoustics of the auditorium

Plan and longitudinal section of the auditorium are shown (*Figure 1*). The sound-absorbing material for the ceiling consists of perforated-steel sheet and two in. of mineral insulation. Between the acoustical material and the masonry roof is a space of about two ft to improve the sound absorption in the low-frequency range. The sound-absorbing material for the side walls consists of perforated asbestos-cement panels and two in. of mineral wool. Average spacing between acoustical material for the walls and the masonry walls is about three in., and serves also to improve the sound absorption in the low-frequency range. The broadloom carpet for the stage is laid on one-half in. of hair-felt cushioning. Surfaces of the back wall are inclined at two different angles to reduce specular reflection from the back wall. The abuse-resistant wainscot of asbestos-cement is mounted so that the panels may vibrate and thereby provide additional low-frequency absorption. Vibration damping for the panels is provided by two in. of mineral wool placed behind the panels. The floor in the audience area of

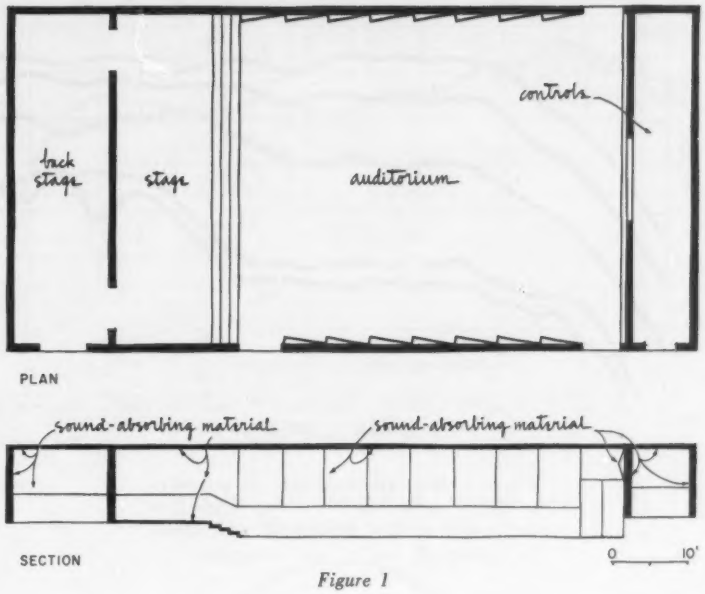


Figure 1

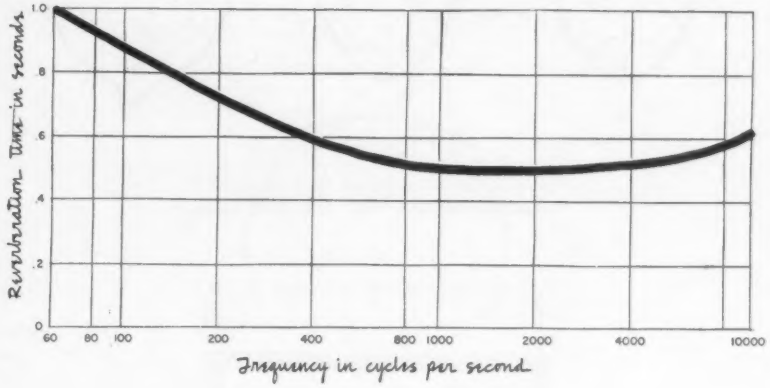
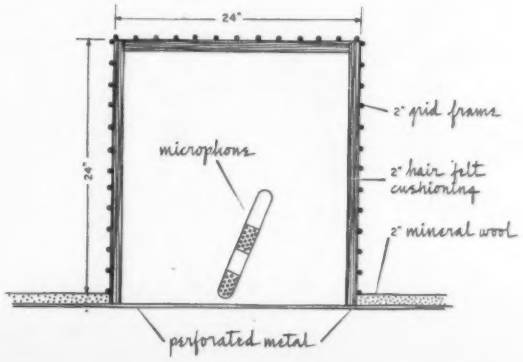


Figure 2—Reverberation time-frequency characteristic of auditorium.

Figure 3—Sectional view of microphone trough.



the auditorium consists of asphalt tile on a concrete floor. A smoothed out reverberation-frequency characteristic of the auditorium is shown (*Figure 2*). The reverberation-frequency characteristic illustrated agrees with the generally recommended optimum characteristics for an enclosure of this volume.

The main walls, ceiling, and floor are constructed of heavy masonry. The average transmission loss provided by these walls is 55 db. As a result of the large reduction provided by the walls and the low noise of the adjacent rooms, the ambient-noise level in the auditorium without an audience is only 30 db.

sound-reinforcing system

Sound is picked up by means of six bigradient microphones, with the output of each microphone fed to an attenuator. The output of the bank of six attenuators is fed to a common power amplifier. Two of the low-power amplifiers are coupled directly to separate power amplifiers. One of the power amplifiers is coupled to the two loudspeakers in the back room. The remaining five low-power amplifiers are connected to the remaining power amplifiers through a delay system. The five power amplifiers are connected to the five banks of loudspeakers in the auditorium. The delay in each link is about 10 milliseconds greater than the transit time of the sound in air to each bank of loudspeakers. By the introduction of progressive delay to each transverse bank of loudspeakers, the first sound which the listener hears is the direct sound from the original source of sound on the stage. It has been established that the apparent source of a series of sounds carrying the same information is determined by the first sound which the listener hears. Therefore, under the above conditions the sound will always appear to come from the stage.

The RCA BK10 Bigradient Uniaxial Microphones[1] used to pick up the sound are located behind the perforated-metal screen which constitutes the ceiling of the stage. The microphones are placed in two troughs constructed of hair-felt cushioning. A sectional view of the microphone and acoustical arrangement is shown (*Figure 3*). The response-fre-

[1] *Olson, Preston and Bleazey,* RCA Review, *Vol. XVII No. 4, p. 522, 1956.*

quency characteristics of the BK10 Microphone for sound incident at angles of 0, 45, 67½, 90, and 180 degrees are shown (*Figure 4*). These characteristics show that there is little frequency discrimination over the useful pickup angle of the microphone.

The polar directional patterns of the BK10 Microphone for 200, 1000, and 4000 cycles are shown (*Figure 5*). These directivity patterns and the response-frequency characteristics (*Figure 4*) show that there is a high order of discrimination for the sides and the rear hemisphere in the mid- and low-frequency ranges. It is in the region below 2000 cycles that practically all of the difficulty due to reverberant and other undesirable sound occurs. The operation shifts from the two uniaxial microphones in second-order gradient operation to the single uniaxial microphone in first-order operation in going from the low-frequency range to the high-frequency range. By the use of diffraction phenomena, it would be a comparatively simple task to develop a microphone with a sharper directivity pattern in the high-frequency region for use in the front uniaxial microphone, if this appeared desirable. In this connection, in actual operation the broader directivity pattern in the high-frequency range does not appear to be an objectionable feature. As a matter of fact, it appears to be desirable, because it adds a tinge of brightness to the reproduced sound.

Measured response of the BK10 Microphone to random sounds in the frequency range below 2000 cycles is 1/9 that of a nondirectional microphone. The increased directional efficiency makes it possible to employ a pick-up distance three times that of a nondirectional microphone, and 1.7 times that of a unidirectional microphone with a cardioid directional pattern.

The high directivity exhibited by the BK10 Microphone provides sufficient discrimination against unwanted sounds for the desired sound to be picked up over the relatively large pick-up distance. A consideration of the directivity pattern of the microphone (*Figure 5*) and the height of the microphone above the sound-source plane show that each mi-

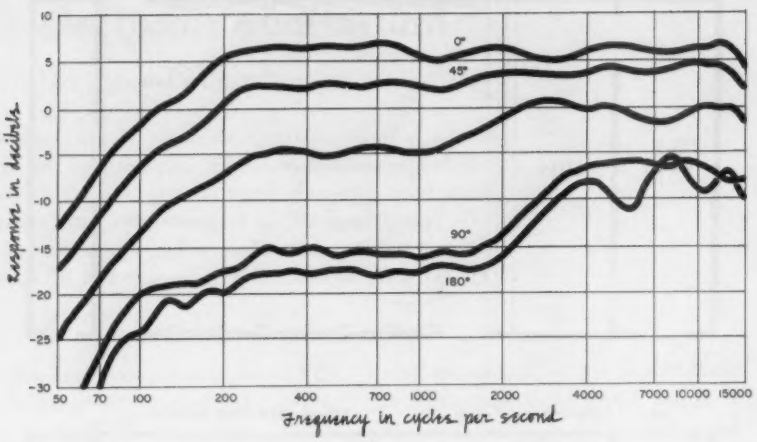


Figure 4—Response frequency characteristics of BK10 microphone for sound incident at angles of 0, 45, 67½, 90, and 180, with respect to cylindrical axis of the microphone.

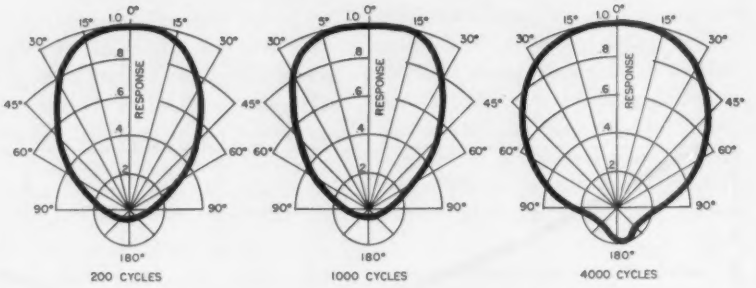
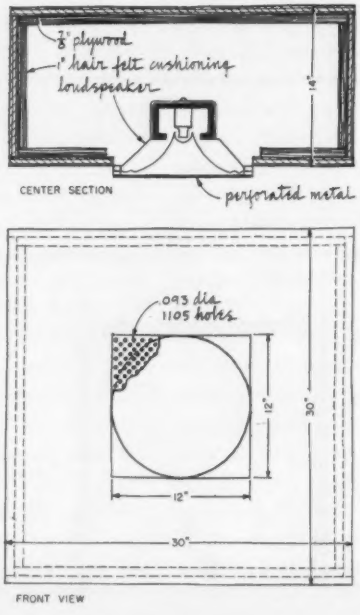


Figure 5—Polar directional patterns of BK10 microphone for 200, 1000, and 4000 cycles.

Figure 6—Sectional view of cabinet for SL12 loudspeaker.



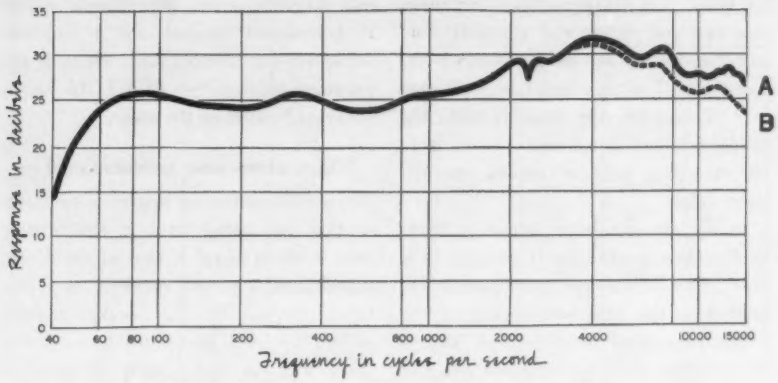
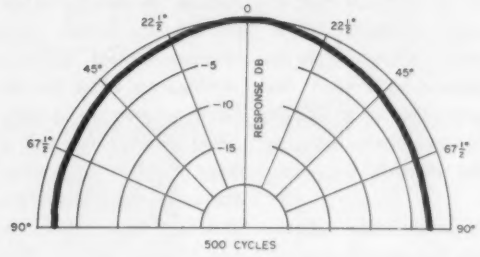
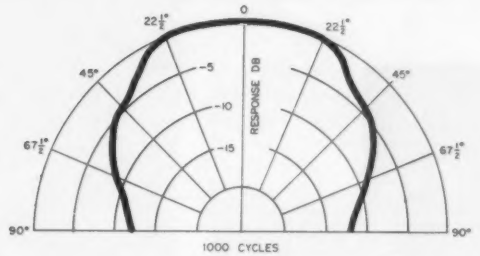
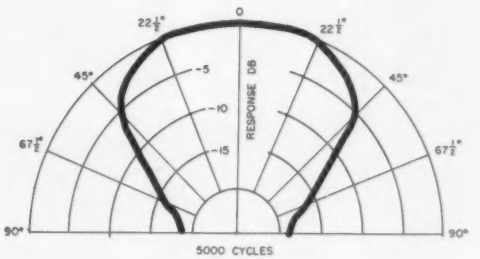


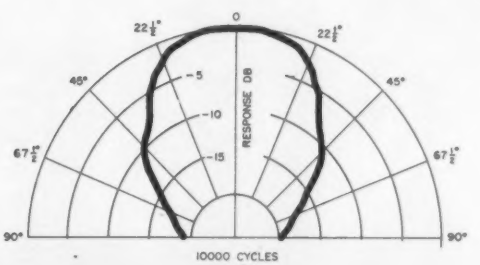
Figure 7—Response frequency characteristics of SL12 loudspeaker. A *Without perforated screen in front of loudspeaker,* B *With perforated screen.*

Figure 8—Polar directional patterns of SL12 loudspeaker for 500, 1000, 5000, and 10,000 cycles.









crophone will cover an area of about 100 sq ft; therefore, six microphones cover the entire stage area.

Each of the loudspeakers used to reproduce the sound is located behind a one-ft section of perforated-metal ceiling surface identical to that used to cover the absorbing material. A sectional view of the loudspeaker arrangement consisting of the RCA SL-12 Loudspeaker covered by perforated metal is shown (*Figure 6*). The cabinet is lined with hairfelt cushioning one in. thick to provide damping of the cabinet volume. The response frequency characteristics[2] of the SL-12 Loudspeaker mounted as illustrated, and without the perforated metal in front of the loudspeaker, are shown (*Figure 7*). It will be seen that the loudspeaker covers a frequency range from 50 to 15,000 cycles. The attenuation introduced by the perforated metal is negligible. The polar directional patterns of the SL-12 Loudspeaker for the frequencies 500, 1000, 5000, and 10,000 cycles are shown (*Figure 8*). A consideration of the directivity pattern of the SL-12 Loudspeaker and the height of the loudspeaker above the listening plane, shows that each loudspeaker will cover an area of about 80 sq ft. Therefore, 20 loudspeakers cover the active listening area of the auditorium.

It has been established that if there are several sources of sound, identical in content and with the same amplitude (or a variation in amplitude within limits) but displaced with respect to time, the sound will appear to come from the source which leads in time. For example, if the delay is 10 to 25 milliseconds, the sound level of the delayed sound must be more than 10 db higher than the undelayed sound before the source appears to be the delayed sound. Thus, it will be seen that if the appropriate delay is introduced in the reproduced sound, the source will appear to be the original source sound. It has also been established that, besides an improvement in the illusion of the reproduced sound, the introduction of delay also gives an improvement in intelligibility.

There is a delay system in each of the five channels feeding the five rows of

[2] *Olson and Preston,* Radio and Television News, *Vol. 51, No. 2, p. 69, 1954.*

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loudspeakers in the auditorium. The delay time in each of these channels should be greater than the difference between the transit time to the listener of the original sound and the reproduced sound. This difference should be in the order of 5 to 25 milliseconds. It happens that the difference between the original and reproduced sound for the bank of loudspeakers nearest to the stage is more than 5 milliseconds. Therefore, a delay is not required in this channel. Furthermore, one delay can be used for channels two and three, and another for channels four and five and still remain within the limits of 5 to 25 milliseconds, between original and reproduced sound (*Figure 9*).

Two different types of delay systems have been employed for providing the delay: a magnetic-tape reproducer with spaced recordings and reproducing heads, and an acoustic delay consisting of a loudspeaker coupled to a pipe along which microphones are spaced. The magnetic-tape delay system is essentially a magnetic reproducing system, with two reproducing channels having the reproducing heads separated from the recording head. The delays required for channels two and three, and channels four and five, are 40 and 60 milliseconds respectively. The tape speed is 30 in. per sec. Therefore, the two reproducing heads are spaced 1.2 and 1.8 in. from the recording head to provide the desired delay.

In the acoustic-delay system, a horn-loudspeaker mechanism is coupled to a pipe. Two ribbon-type microphones are located in the pipe and reproduce the sound transmitted down the pipe. Delays of 40 milliseconds for channels two and three, and 60 milliseconds for channels four and five, require a spacing of the microphone units from the loudspeaker mechanism of 44 ft and 66 ft respectively. Considerable high-frequency compensation is required to overcome the attenuation in the pipe. However, due to the small sound power required to obtain a high sound pressure in a pipe, the frequency compensation is not a difficult problem. The advantage of the acoustic-delay system is the relatively high ratio of signal to noise.

A monophonic/stereophonic phonograph and magnetic-tape reproducers are provided for the reproduction of discs and magnetic-tapes. Monophonic sound is reproduced through the auditorium sound system. Stereophonic sound is reproduced through two RCA LC1A Loudspeakers located on the stage.

operation and performance

The sound-reinforcing system is operated so that the sound level in the seating area is about equal to that of the direct sound from a person speaking at a distance of three ft. The speaker can be picked up over the entire area of the stage with no appreciable variation in level or quality. The convenience and mobility afforded by the speaker not having to wear a personal microphone are outstanding and desirable features. It is not necessary to maintain continuous, manual monitoring—after the controls are set, the sound reinforcing system operates without further attention. The combination of a low-level sound-reinforcing system, constant efficiency of sound pick-up over the stage area, uniform distribution of reproduced sound in the auditorium, and a progressive delay system provides a sound-reproducing system in which one is not aware that the original sound is reinforced.

Photo of stage section of acousto-electronic auditorium (above). *View shows arrangement of perforated asbestos-cement panels on the side walls* (right).

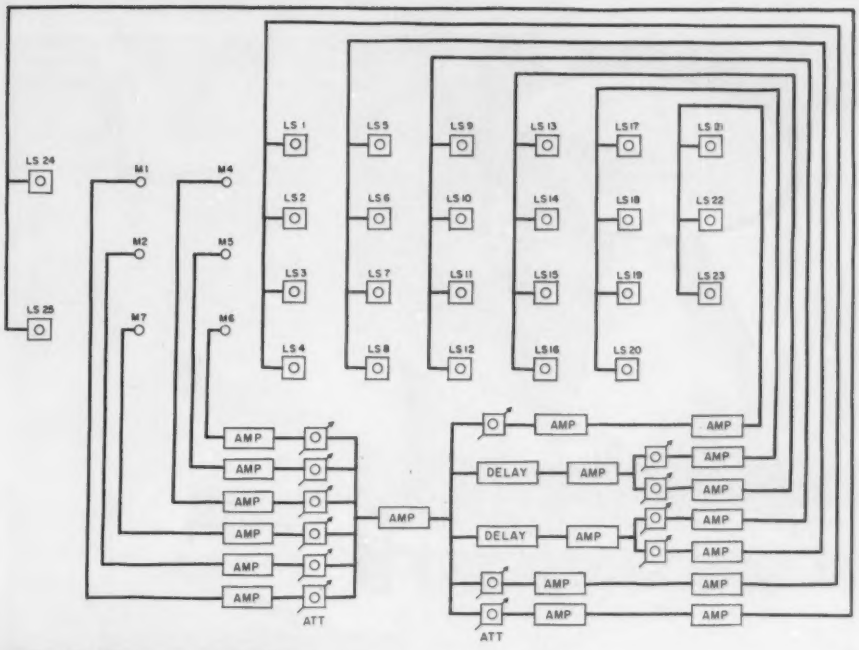
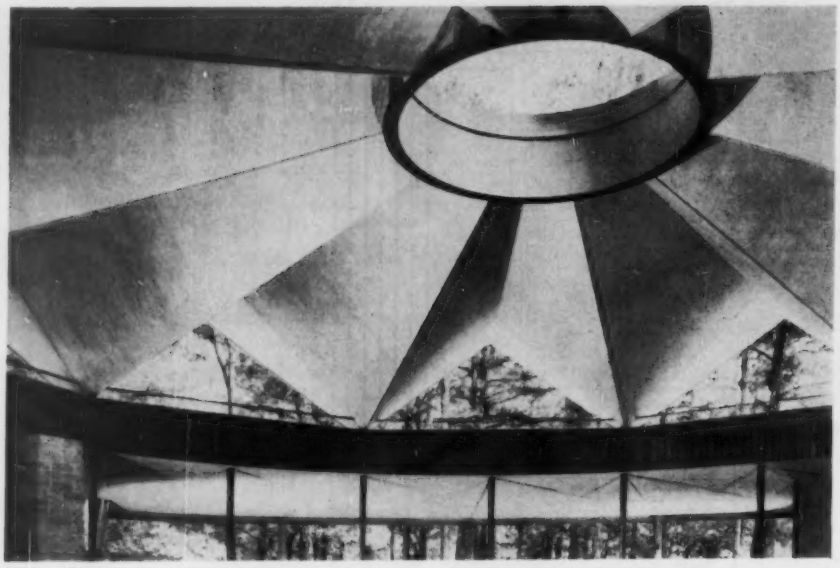


Figure 9—Schematic diagram of sound-reinforcing system of the acousto-electronic auditorium employing two delay systems.

A photograph of back wall, with surfaces inclined at two different angles to reduce specular reflection (left). *Control room of acousto-electronic auditorium* (below).

p/a selected detail

skylight



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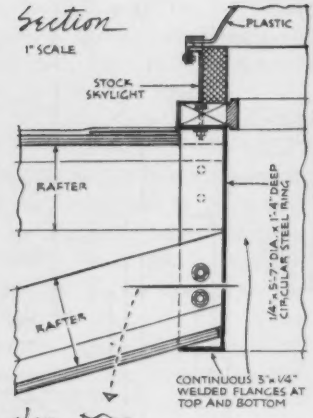
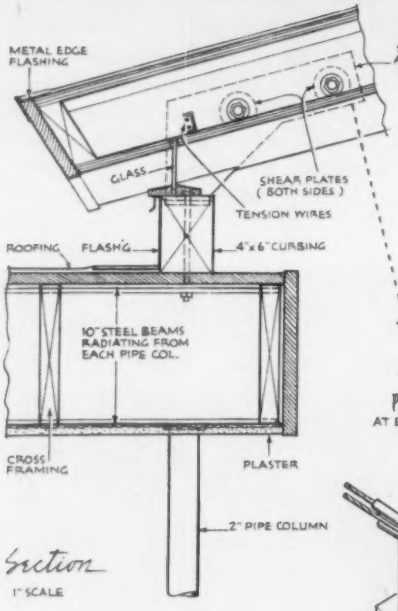
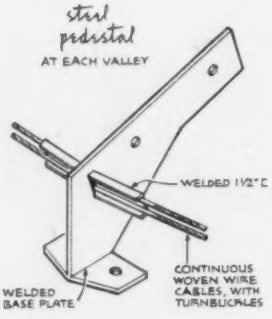
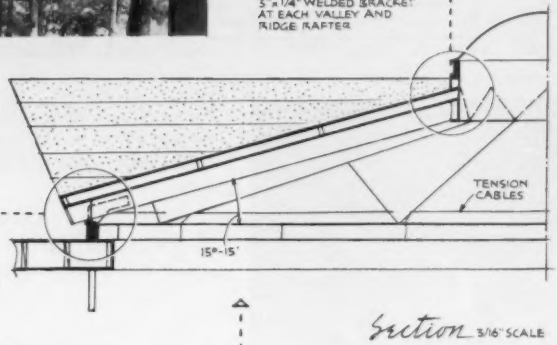
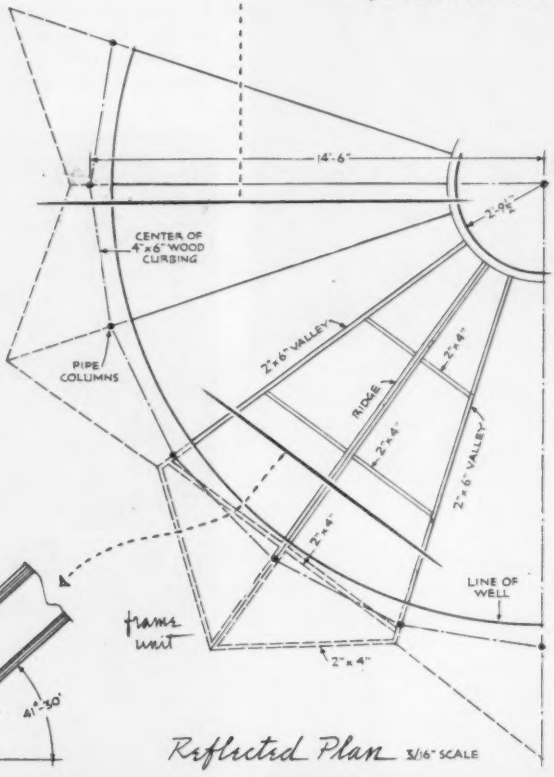
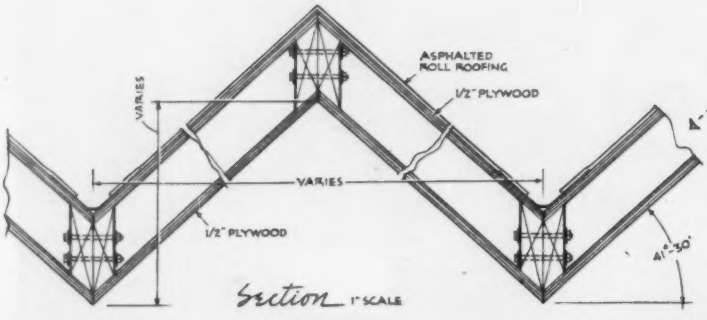

Section
1" SCALE
PLASTIC
STOCK SKYLIGHT
RAFTER
RAFTER
1/4" x 5'-7" DIA. x 1'-4" DEEP CIRCULAR STEEL RING
CONTINUOUS 3" x 1/4" WELDED FLANGES AT TOP AND BOTTOM
plan
3" x 1/4" WELDED BRACKET AT EACH VALLEY AND RIDGE RAFTER







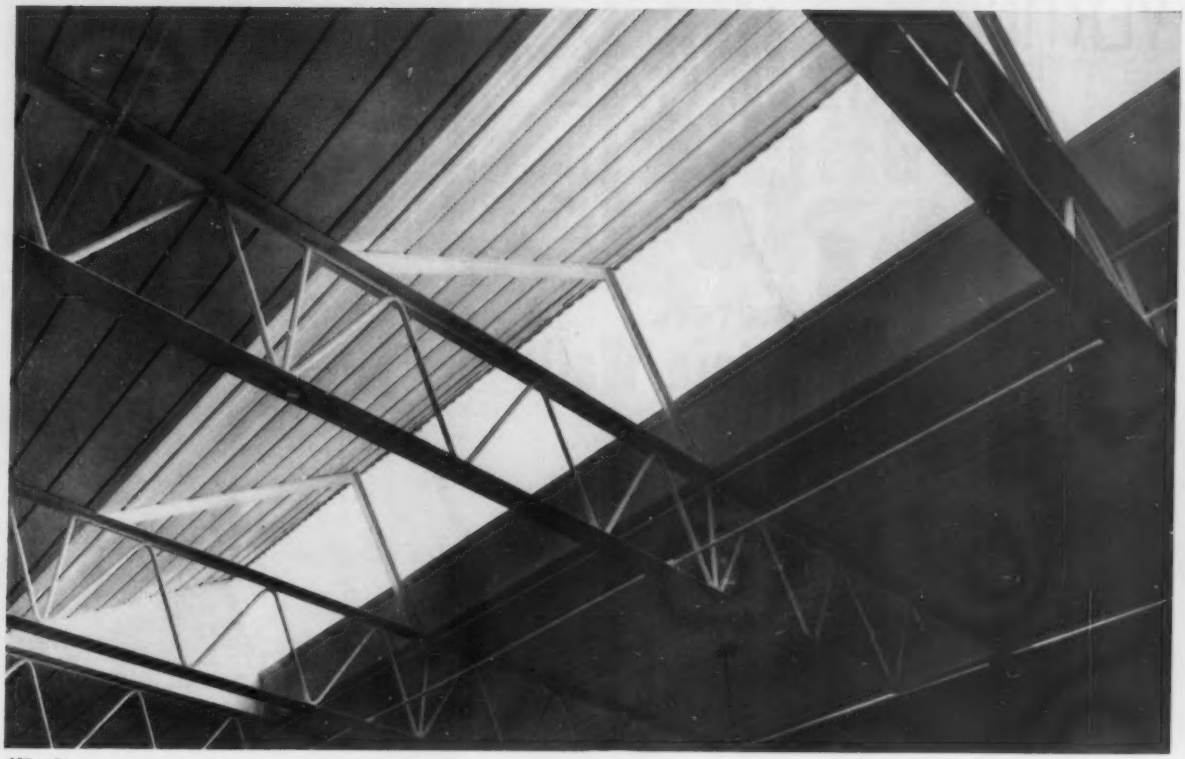




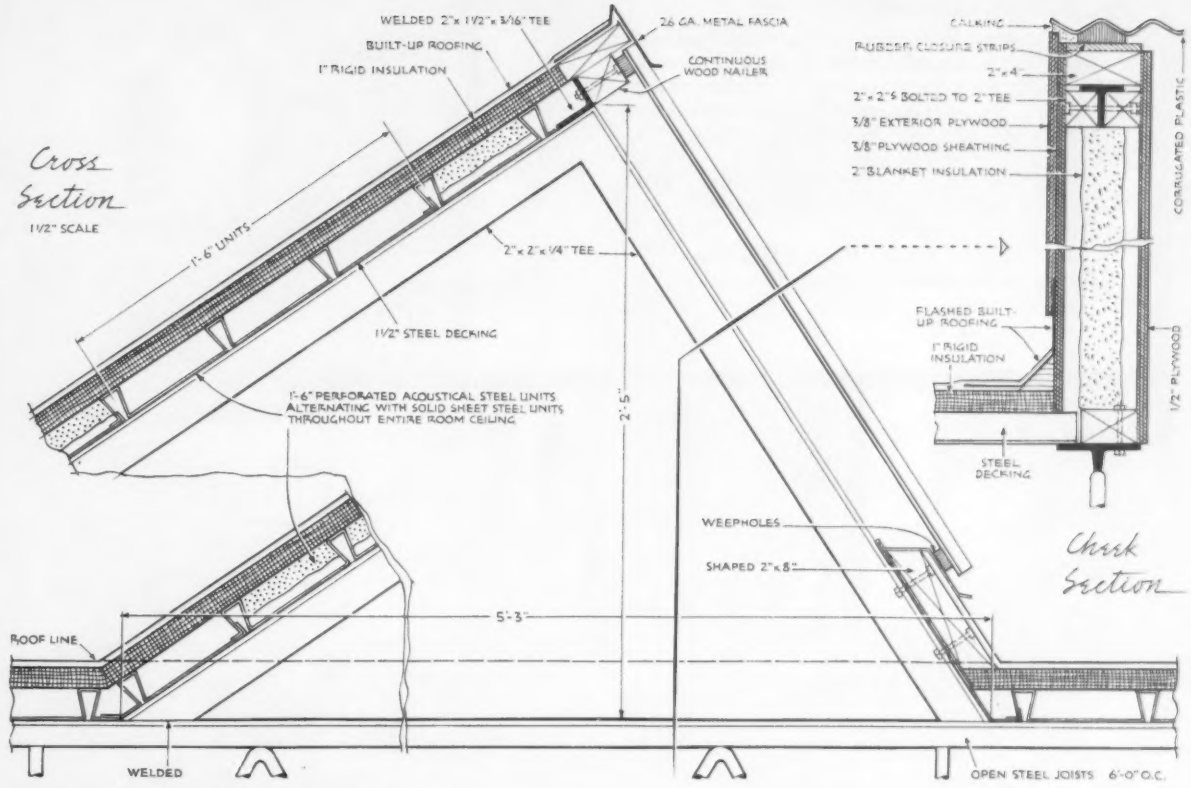
RESIDENCE, Atlanta, Georgia

Finch, Alexander, Barnes, Rothschild & Paschal, Architects

skylight



ART HUPY



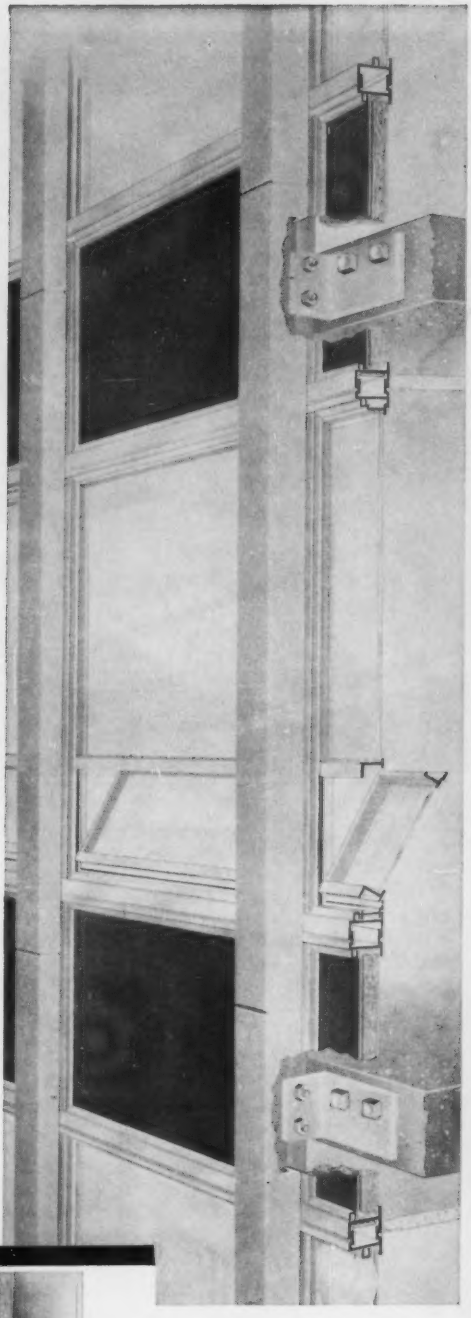
SCHOOL, Mercer Island, Washington
Bassetti & Morse, Architects

VERTICAL *or* HORIZONTAL*

Bayley

ALUMINUM and STEEL

Windows and Curtain Walls



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Bayley Curtain-Wall Systems, of standard design, are readily adaptable to a wide variety of arrangements of fixed or ventilated window units and choice of decorative panels. They permit the designer full latitude to exercise his preference in wall treatment without costly, special custom designing.

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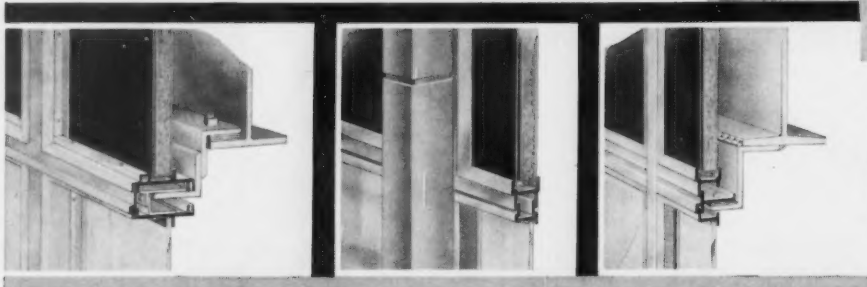

Write for copy of catalog C-59. Also see it in Sweet's Architectural and Industrial Construction Files.

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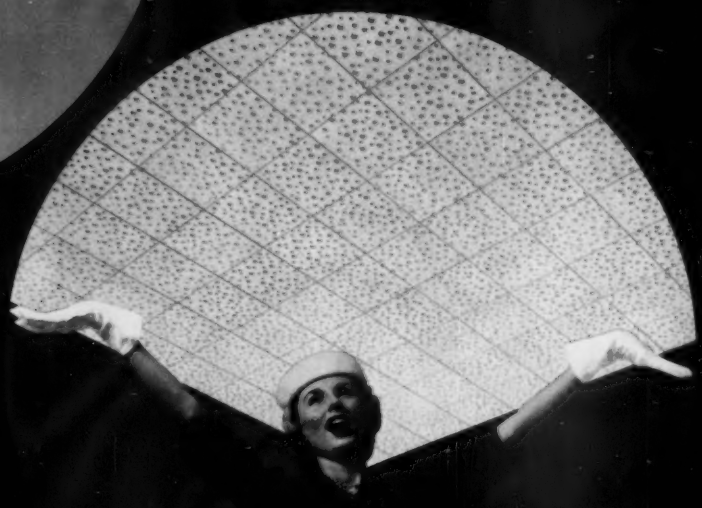
FORESTONE DRIFTWOOD

A truly unique, completely random pattern that blends into an all-over textured effect to complement any room design or decorative theme.



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Walter Dorwin Teague

Now you can specify Forestone*, the original fissured woodfiber acoustical tile, in a broad range of patterns and textures. These new textures give you more flexibility of design in which to create the ceiling harmony, contrast or special effects you conceive. Whichever Pattern you choose, you always get Forestone's well known permanent beauty, efficiency and economy.

Walter Dorwin Teague and Associates, leading designers and research specialists, were commissioned to create these new Forestone textures to bring new concepts of noise controlled beauty into the homes, offices, commercial and industrial structures you design.

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FORESTONE STRIATED

This handsome new tile features an attractive straight line pattern and may be arranged into various ceiling designs such as diagonal and parquet.

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The original deep-fissured wood fiber acoustical tile has maintained a position of leadership through exceptional product quality and beauty.

EFFICIENCY. The deep-etched tile surface absorbs up to 70% of the sound that strikes it, provides permanent noise control and an extra dimension of beauty.

FIRE RESISTANT. Soft-white finish is flame resistant, meets Class C requirements of Federal Specifications SS-A-118b, and provides excellent light reflection.

EXCLUSIVE BIOTOX process protects tiles from termites, dry rot and mold.

SIZES & EDGES. New patterns are available in 12″ x 12″ sizes with butt-joint or flange-joint edges. The original Forestone pattern is also available in 12″ x 24″ with flange-joint, and in ceiling board sizes.

APPLICATION. Butt-joint tiles may be applied by nailing, cementing or mechanical suspension. Flange-joint tiles are stapled to furring strips.

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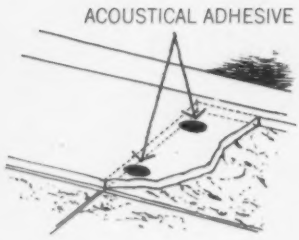
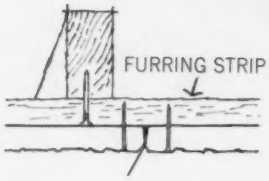
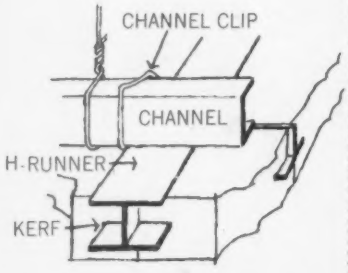
MOUNTING DETAILS



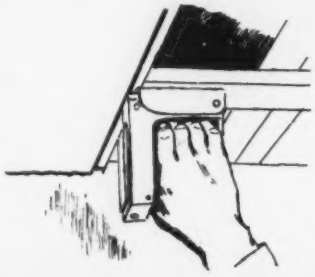
Application by cementing to solid backing.



Application by nailing to wood furring strips.



Application by mechanical suspension (H & T) system.



Application by stapling to wood furring strips.

SIMPSON'S COMPLETE LINE OF ACOUSTICAL MATERIALS

Forestone patterns provide attractive textured surfaces for beautiful, efficient and economical sound-conditioning.

Standard Drilled Tile features a smooth surface, Hollokore drilling and a washable surface.

Random Drilled Tile combines a full random pattern with three different hole sizes and satin-smooth surface.

Forestone Ceiling Board panels fit suspension systems for quick access to overhead equipment.

Roof Decks with Forestone and Standard Drilled surfaces combine acoustical efficiency, high insulation value and sturdy structural support for open beam applications.

Fissured Mineral Tile is spun from natural rock fibers into beautiful, incombustible, highly efficient tiles.

Metal Acoustical Units snap into metal suspension systems for easy overhead access.

Perforated Cement Asbestos Board and Hardboard are durable, practical facings for use with sound absorbing backing.

This full range of acoustical materials, plus the skilled training and wide experience of Simpson Certified Acoustical Contractors is your assurance of efficient and economical installations for all your requirements.

SOUND ABSORPTION COEFFICIENTS . . . According to tests accepted by the Acoustical Materials Association

Thickness	Mounting*	Coefficients** 125	250	500	1000	2000	4000	Noise Red. Coef.	Unit Size Tested	Weight Lbs. Per Sq. Ft.	Surface
9/16"	1	.04	.21	.71	.69	.72	.72	.60	12" x 12"	.58	Fissured
9/16"	2	.03	.68	.61	.62	.73	.79	.65	12" x 12"	.57	Painted
3/4"	1	.22	.35	.80	.68	.78	.83	.65	12" x 12"	.77	Fissured
3/4"	2	.26	.73	.62	.67	.79	.84	.70	12" x 12"	.77	Painted
3/4"	7	.63	.48	.55	.68	.78	.81	.60	12" x 12"	.77	
9/16"	1	.13	.31	.68	.63	.69	.79	.60	12" x 12"	.68	Driftwood
9/16"	2	.23	.63	.51	.56	.70	.80	.60	12" x 12"	.68	Painted
9/16"	1	.10	.30	.68	.59	.64	.84	.55	12" x 12"	.69	Starlite
9/16"	2	.19	.63	.49	.60	.70	.81	.60	12" x 12"	.69	Painted
9/16"	1	.15	.25	.72	.65	.69	.80	.60	12" x 12"	.63	Striated
9/16"	2	.04	.64	.56	.60	.67	.82	.60	12" x 12"	.63	Painted
3/4"	1	.18	.47	.72	.63	.72	.74	.65	12" x 12"	.87	Striated
3/4"	2	.29	.68	.56	.58	.76	.81	.65	12" x 12"	.87	Painted
3/4"	7	.59	.43	.49	.65	.86	.92	.60	12" x 12"	.78	

*Mountings: No. 1, cemented to plasterboard; considered equivalent to cementing to plaster or concrete ceiling. No. 2, nailed to 1"x3" wood furring 12" o.c. No. 7, mechanically mounted on special metal supports.

**The noise reduction coefficient is the average of the coefficients at frequencies from 250 to 2000 cycles inclusive, given to the nearest 5%.

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FOR ALL YOUR SOUND CONDITIONING NEEDS

SIMPSON LOGGING COMPANY

Shelton, Washington

SACMP 97/2091

Litho in U.S.A. on Simpson Coated Offset (C2S) 80#

Barbara J. Melnick

remodeled kitchen/dining area

With notable skill, Architect Keith Kolb remodeled a small kitchen, using simple and elegant materials and adroit lighting to create an exceptional sense of order and space. The existing Pruzan kitchen in Seattle, Washington, had inadequate lighting and storage, counter, and dining space. Wall areas were wasted and space relationships were clumsy. All doors between rooms now save space, folding into narrow panels or sliding into the wall.

The clients wanted a kitchen that would be open to the dining and living rooms but also concealed from view. An excellent solution, the walnut dividing wall, provides storage accessible to both kitchen and dining room; opens the kitchen through a buffet counter; and preserves visual privacy when closed. Walnut kitchen cabinets, like the client's furniture, are complemented by white counters and flooring. Elegant and simple, these furnishings make the kitchen, opened, part of the living area.

Lighting increases the feeling of space. Indirect lighting floods the ceiling perimeter, counters, and walls with warm white light, enlarging the small space. Seen from the dining room, the kitchen seems friendly and enticing when the far counter is illuminated; or the buffet counter alone may be accented and the rest of the kitchen lost in darkness.

The new breakfast nook was extended onto the existing deck for the superb view to the east. Its built-in dining counter, with shallow drawers for storing silver, napkins, placemats, is also a buffet for serving to the deck. A plastic blind cuts the direct early morning sunlight.

Photos: Dearborn-Messar

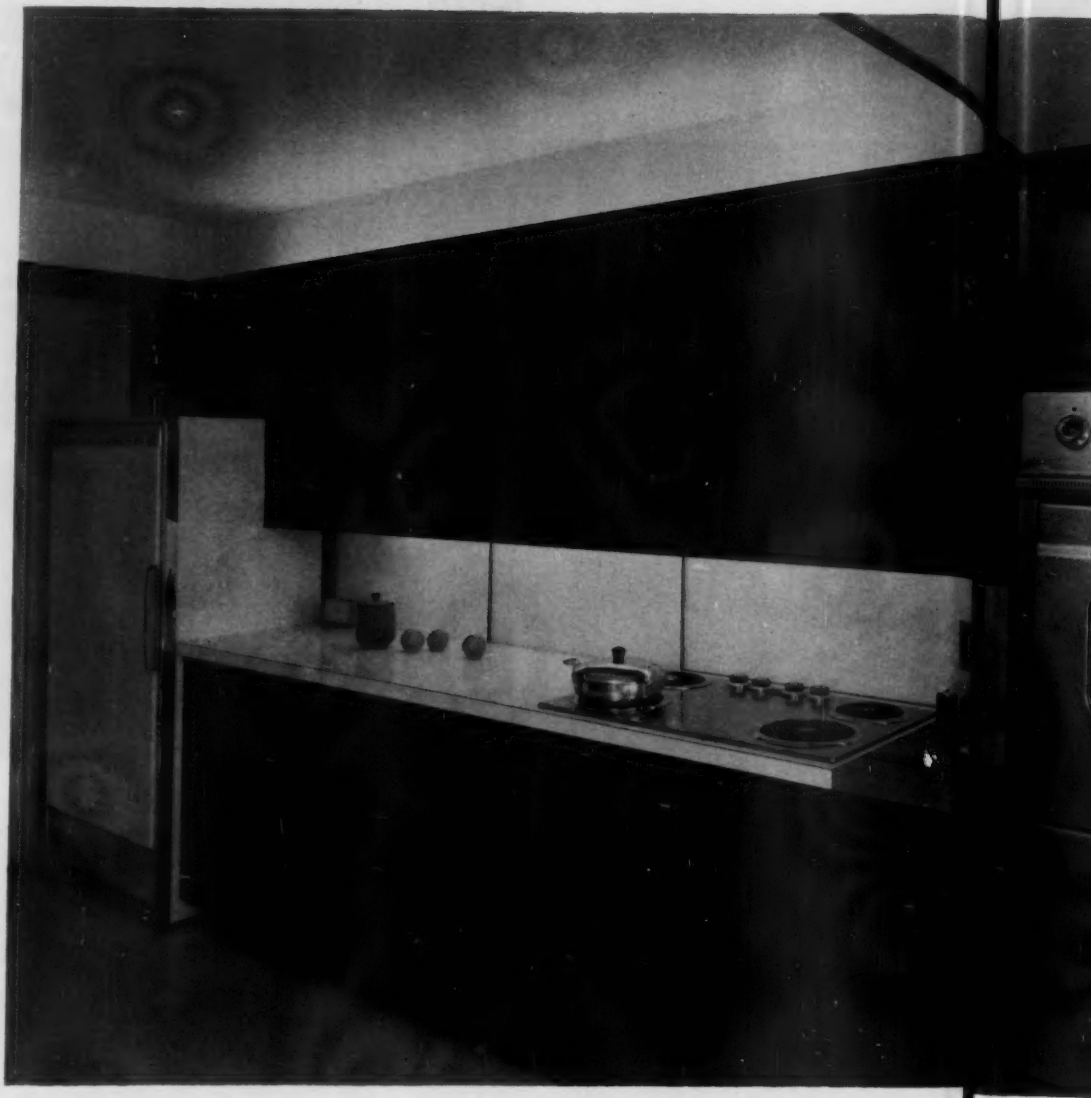
SACMP 97/2091 Litho in U.S.A. on Simpson Coated Offset (C2S) 80#

kitchen: dining wall

client	Mr. & Mrs. Carl Pruzan
location	Seattle, Washington
architect	Keith R. Kolb
heating engineer	Richard Stern

Walnut flush doors (replacing a fixed wall), when closed, create a handsome dividing wall which conceals kitchen from dining and living rooms. Walnut cabinets elegantly furnish the kitchen which, viewed through the open buffet counter, becomes part of the dining room and extends the space. Special lighting effects increase the sense of depth. Opened doors give the dining room access to storage. Silver drawers are trays reached from either side.

kitchen: work storage space



Carefully lighted countertops, generous work areas, surround activity centers. Storage space is provided in cupboards whose height and size are tailored to the client's height and reach; pull-out shelves under cabinets forming steps for reaching top shelves. Storage conveniences include recessed spice cupboard; shelves and panels which roll out; insulated cooler closet into which milk is delivered from outside.

data

cabinetwork

All: natural walnut/recessed handles, touch latches, magnetic catches eliminate exposed hardware/pull-out shelves form steps under all cabinets/white Formica counters/Formica Corp., Subsidiary of Cyanamid, 4630 Spring Grove Ave. Cincinnati 32, Ohio; architect-designed/custom-made. **Dining/Kitchen Wall:** dining side/liquor cabinet below pass-through doors/slide-through trays for silver/china, glassware storage; kitchen side/disappearing towel rack in cabinet with heating duct for drying/Knape & Vogt Mfg. Co., 658 Richmond, Grand Rapids, Mich.; **Refrigerator/Oven Wall:** cabinets/tray storage/metal-lined bread, cake drawers on rolling slides/mixer on adjustable shelf which lifts up beside bread board/rolling shelves for pots/pull-out hardboard panels for pans ladles/metal-lined fruit, vegetable drawers in insulated cooler/special drawers, hardware/Washington Steel Products, Inc., 1940 E. 11 St., Tacoma, Wash.; wall-recessed spice cupboard with sliding doors; pull-out flour sifter in cupboard near refrigerator; fan over cooking top has intake under and above cupboards.

doors, windows

Folding Doors: natural walnut; Novoply painted white/United States Plywood Corp., 55 W. 44 St., New York, N.Y.; accordion door hanger/Grant Pulley & Hardware Co., High St., West Nyack, N.Y. **Breakfast Nook:** aluminum tube door to deck, aluminum sash windows/architect-designed/custom-made/Fentron Industries, Inc., 2801 Market St., Seattle, Wash.; insulating glass/Acme Glass Co., Inc., 2801 Market St., Seattle, Wash. **Blinds:** white plastic/Jayless Traversing Decorator Screens/Jayless Co. Sales Corp., 514 W. Olympic Blvd., Los Angeles, Calif.

equipment

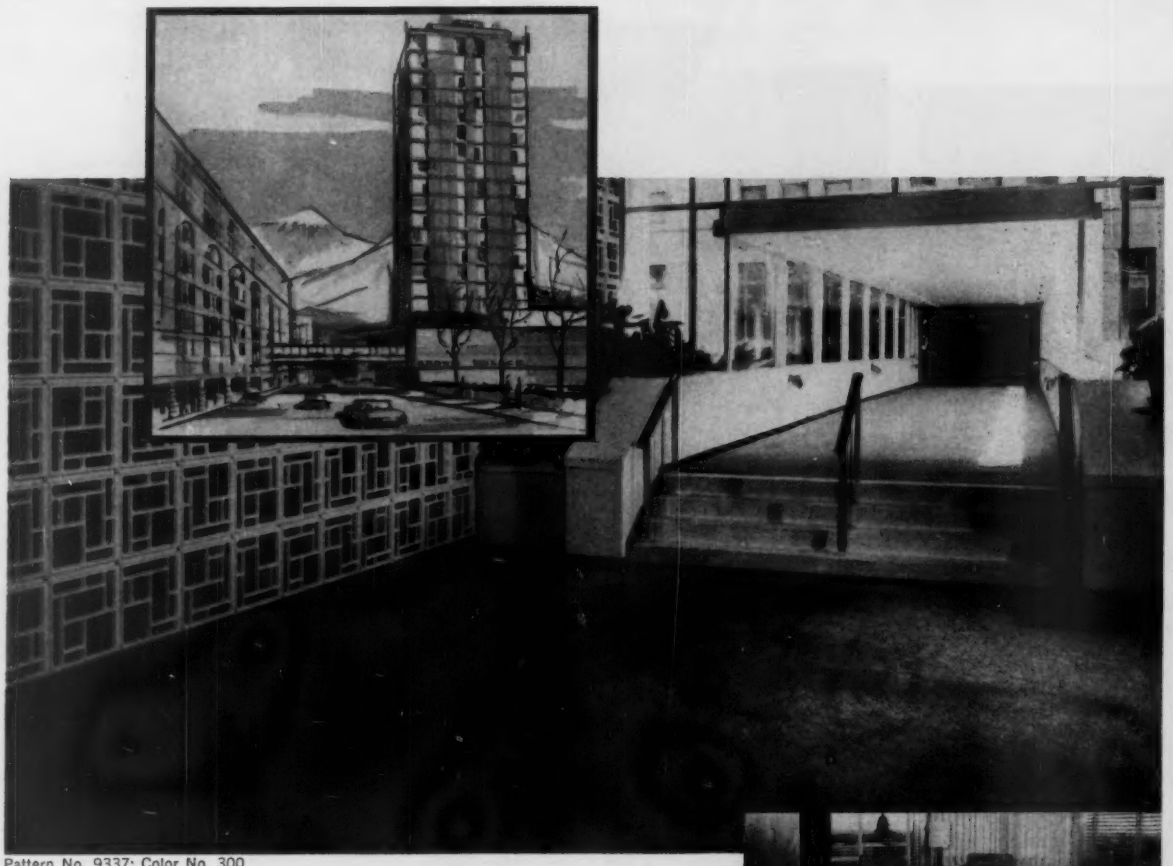
Refrigerator: white/Frigidaire Div., General Motors Corp., Dayton, Ohio. **Dishwasher:** stainless steel/Kitchenaide/The Hobart Mfg. Co., Troy, Ohio. **Cooking Top:** stainless steel/The Tappan Stove Co., Mansfield, Ohio. **Oven:** stainless steel/two-level/Hotpoint Co., 5600 W. Taylor, Chicago, Ill. **Fan:** Trade-Wind Motorfans, Inc., 1755 Paramount Blvd., Rivera, Calif.

lighting

Breakfast Nook: incandescent downlights/Lightolier, Inc., 346 Claremont Ave., Jersey City, N.J. **General Indirect Lighting:** lumiline-tube chain, concealed by baffles on cupboards, floods perimeter of kitchen ceiling/single switch/Plug-In strip/National Electric Products Corp., 2 Gateway Center, Pittsburgh, Pa. **Refrigerator/Oven Counter:** lumiline-tube chain concealed by baffles under cupboards/single switch/Plug-In strip for appliances/National Electric Products Corp. **Sink Counter:** incandescent bulbs concealed in a box between drawers/separate switch. **In Cooler:** ceiling light automatic with door opening, closing.

walls, ceiling, flooring

Walls, Ceiling: plaster painted white, stippled eggshell ceiling in kitchen. **Flooring:** vinyl/white with beige speckle/Amtico/American Biltrite Rubber Co., Trenton 2, N.J.



Pattern No. 9337: Color No. 300

The new Brown Palace West in Denver is a breathtaking addition to the 67-year-old Brown Palace Hotel "landmark." This modern architectural skyscraper has the look of tomorrow yet is deep-steeped in Western tradition. Careful planning proved to be the keynote for the entire structure. Architects Havens-Batchelder and Holmes Contract Division held creative consultations in which practical solutions were worked out graphically. All carpet was woven by Holmes on a modular basis to exactly fit rooms, hallways and lobbies with the result there was less than a 2% waste in yardage. To solve the unique traffic problem posed by roll-away studio beds, Holmes Contract Staff developed a carpet with a pile that offers maximum resistance to this extreme wear.

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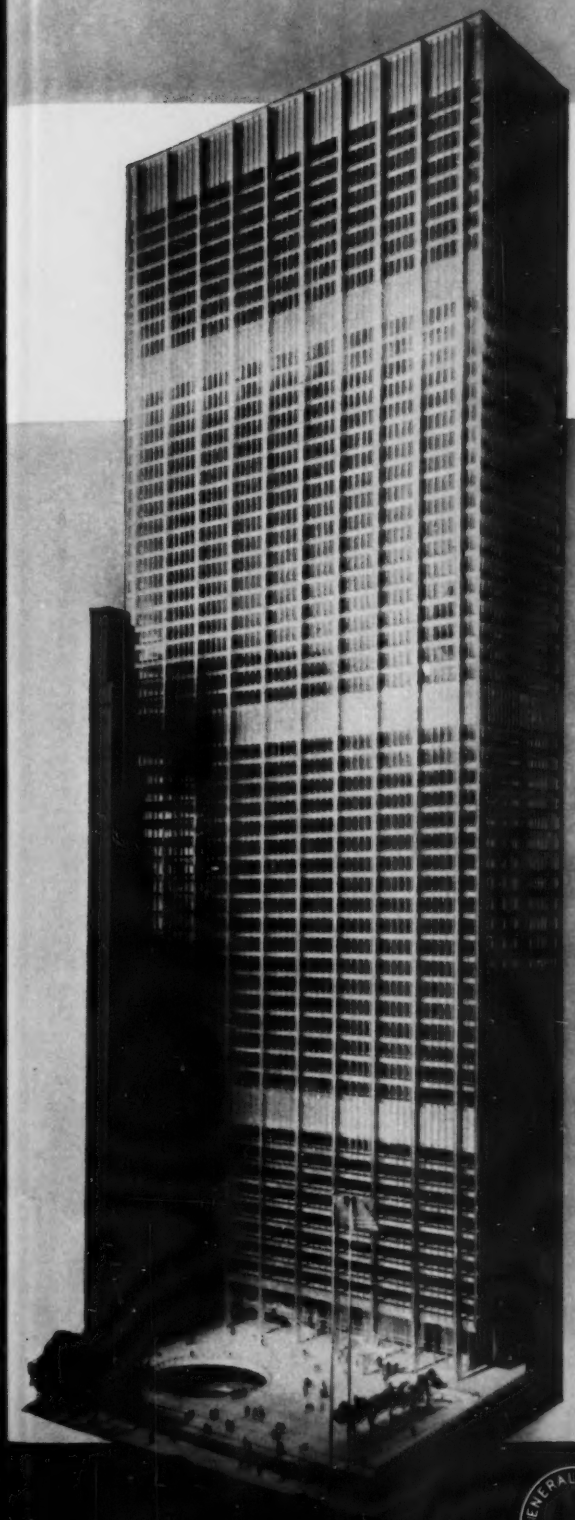
Archibald Holmes & Son

Above and below: Pattern No. 6052: Color No. 608

FOR THE NEW CHASE MANHATTAN BANK BUILDING

NEW YORK CITY



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IN ALUMINUM

by

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To make sure your next curtain wall job will go easier, call in the General Bronze representative right at the start. He can help you save valuable time and money. Our catalogs are filed in Sweet's. For a file copy, address Dept. PA-5911.

Chase Manhattan Bank Bldg., New York City
Architects: Skidmore, Owings & Merrill
Contractors: Turner Construction Co.

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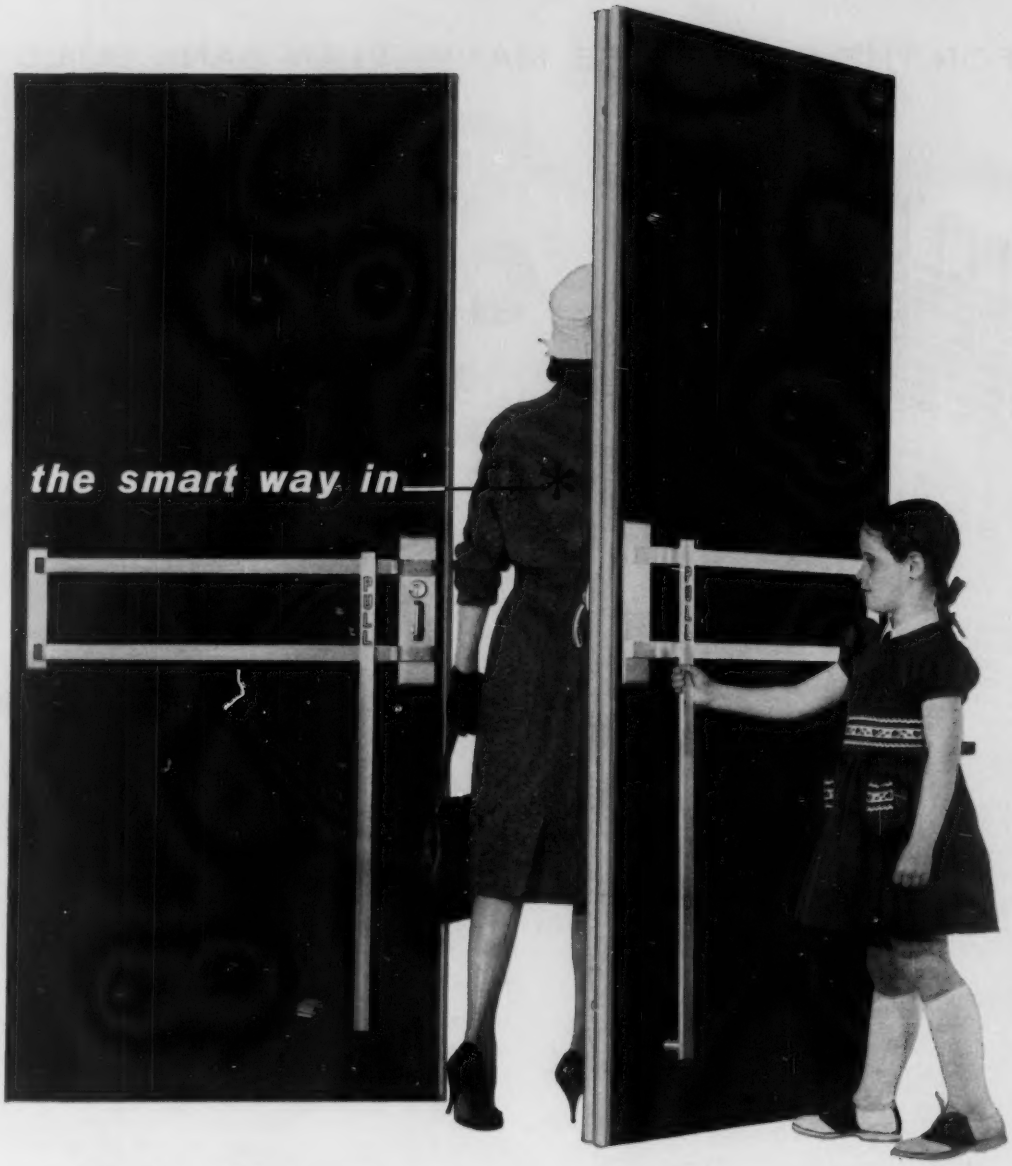

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illustrated above: all extruded aluminum modern design with extended and engraved grips. Catalog number E282-ENG. on active door; E282DT-ENG. on inactive door.

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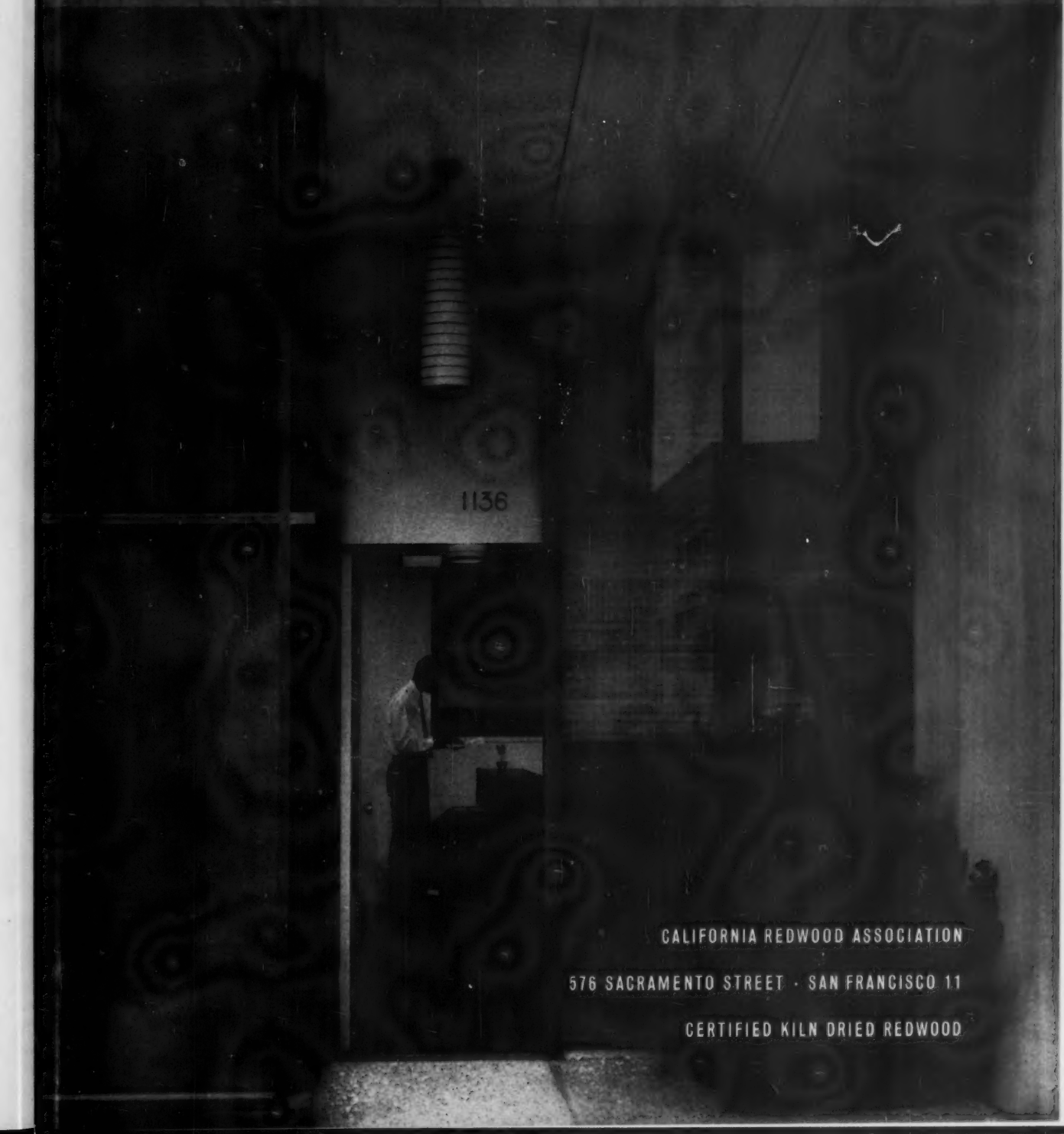

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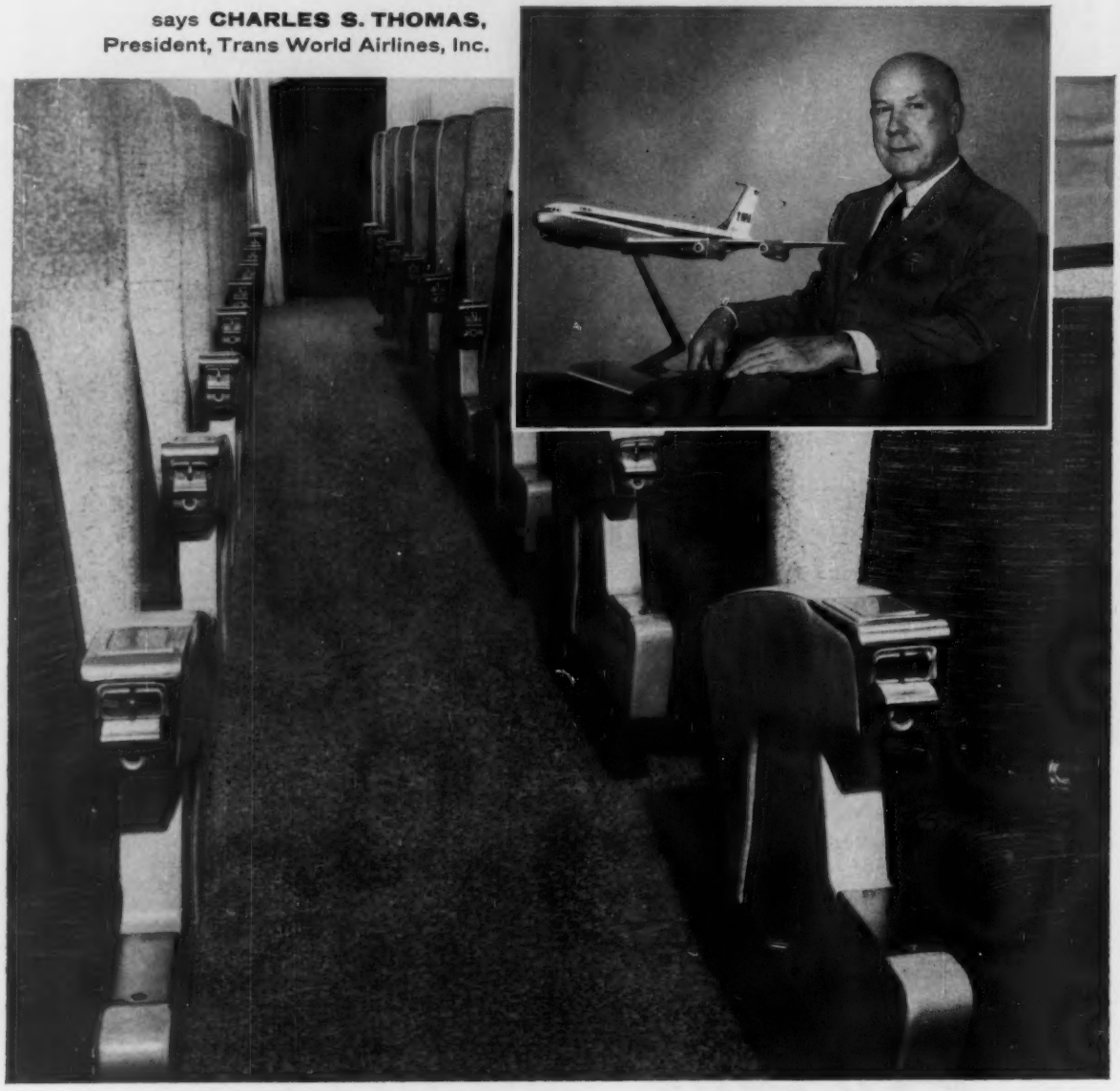

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The Barrett "Anchorbond" Roof is ready now! Development of a suitable asphalt—involving improved methods of quality control—now makes it possible for Barrett to extend its famous bond to asphalt built-up roofing for 10, 15, or 20 years. "Anchorbond" Roofs, applied by Barrett Approved Roofers, receive the same careful inspection service by Barrett trained inspectors, before, during and after installation, that is given to the famous Barrett SPECIFICATION® and BLACK DIAMOND® Bonded Roofs.

The "Anchorbond" Roof utilizes Barrett asphalt felt with the newly-formulated "Anchorbond" Cement—a high-grade asphalt for the construction of flat built-up slag or gravel-surfaced roofs. "Anchorbond" Cement has good body to assure waterproofing between the layers of felt, and meets Barrett's strict low-water absorption standards. It has excellent adhesive and self-sealing characteristics, and its weathering stability is such as to anticipate trouble-free service for the duration of the bonded guarantees.

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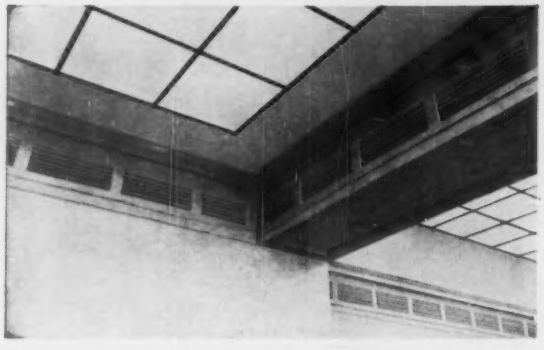
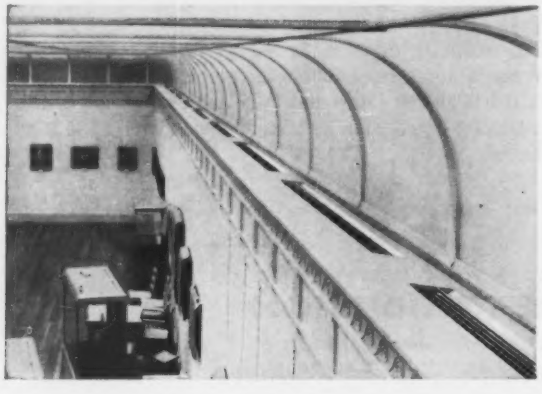
Allied Chemical

Draftless Anemostat Air Diffusers at Sterling and Francine Clark Art Institute





The photograph above illustrates an Anemostat Straightline Air Diffuser installation in the gallery design of the Sterling and Francine Clark Art Institute at Williamstown, Mass. The conditioned air is supplied through Straightline Diffusers located on all four sides of the gallery. The diffusers not only draftlessly introduce conditioned air into the gallery, but also blend into the architectural design.

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Walter Dor[illegible] Teag[illegible] esigns unique, harmonious store fronts of *SHARONART** stainless steel

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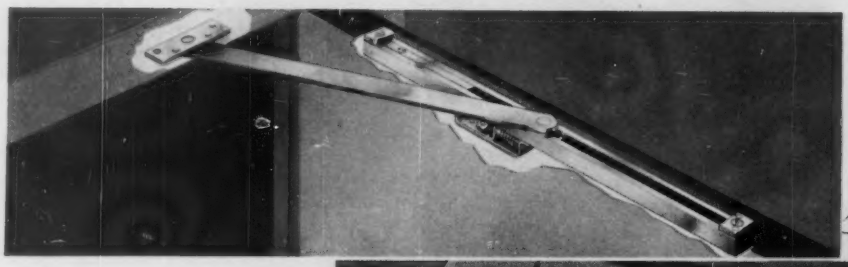

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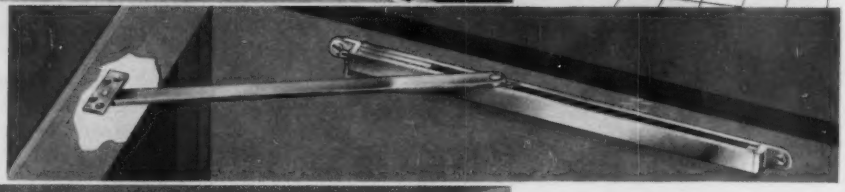
GJ 90▶ surface type (handed)



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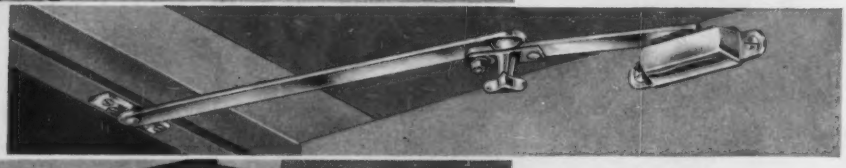

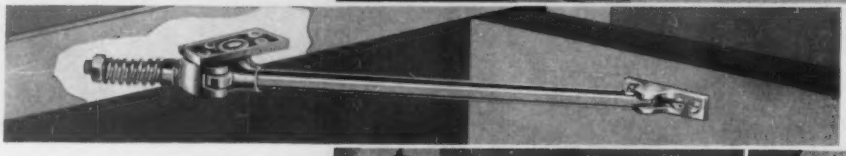

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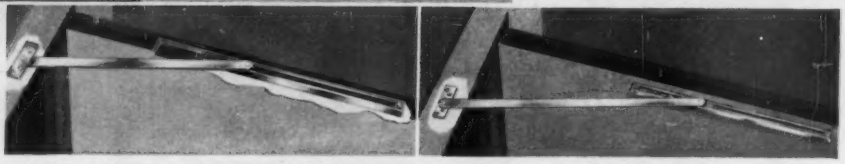
GJ 300 and GJ 500 series▶ (non-handed) concealed for single and double acting interior doors. Surface type for single acting doors. Spring cushion types and friction holder type.



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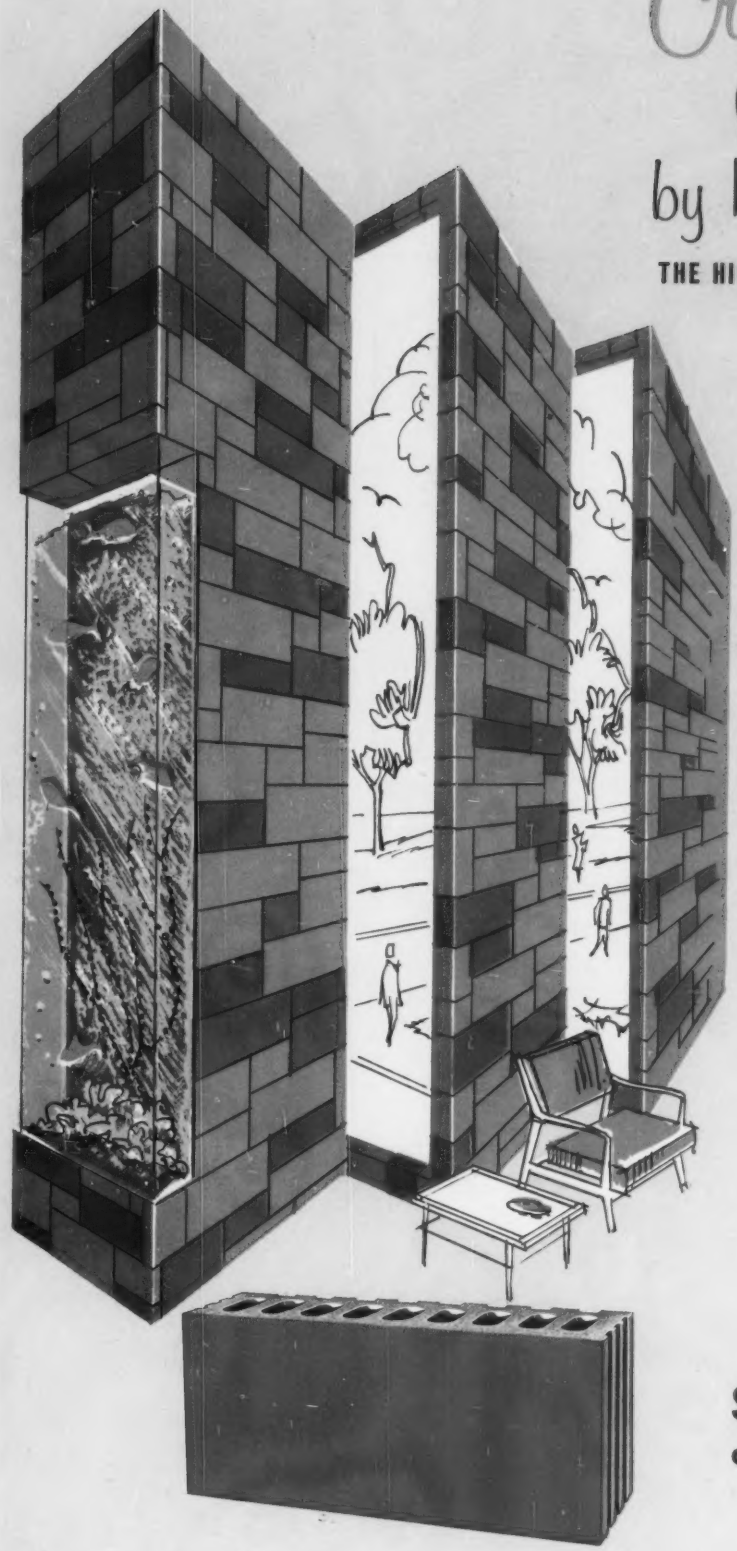

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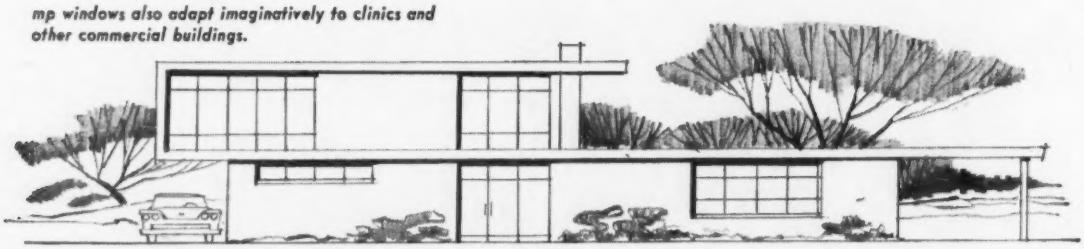

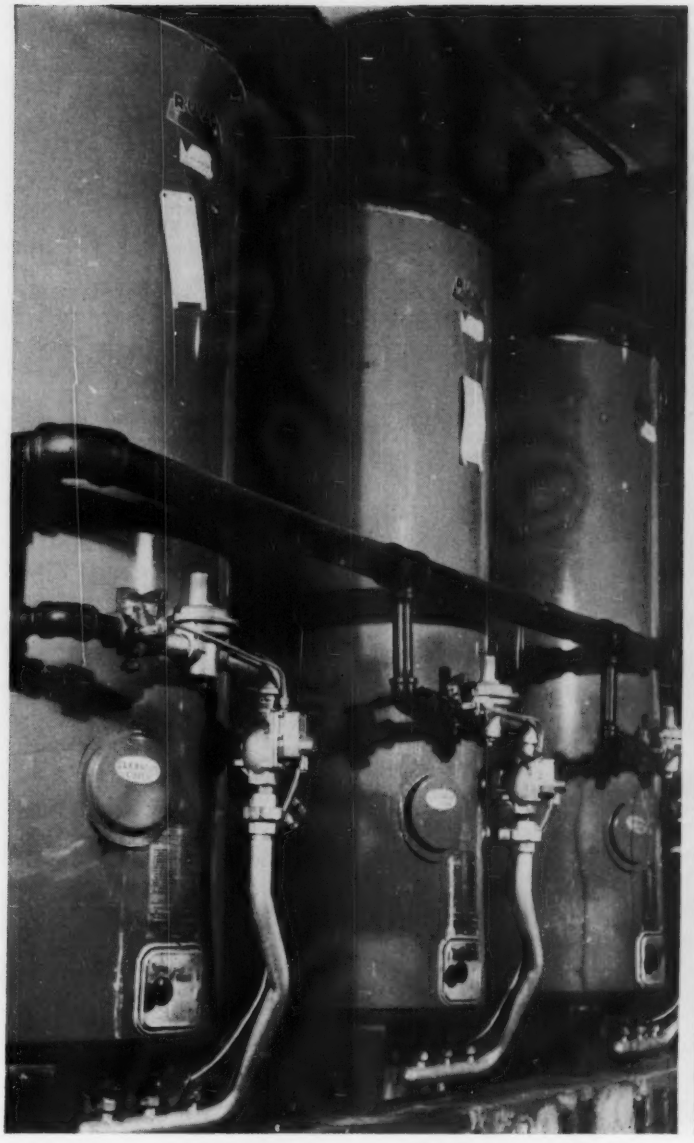

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Three Alcoa alloy gas water heaters put a fast stop to complaints about lack of adequate hot water in the Goldine Apartments, Highland Park, Michigan.

The three Ruud-Alcoa units are used as automatic storage water heaters for the 74 apartments and nine stores located in the single building, but they can easily be connected to auxiliary storage tanks and used as circulating water heaters. They take up a minimum amount of space in a small basement room that is often flooded from water seepage. All three units have provided trouble-free, fast-recovery, year-round service since they were installed in October, 1956—even though water often comes up over the burners.

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Plastic Design In Steel Subject of Text and Manual

*By William J. McGuinness**

Background

From the time of Dr. Gabor Kazinczy who published some early analyses and tests on plastic design in 1914, much has been written about this subject. Notable were the works of Van den Broek in the United States and of J. F. Baker in England. All of this material was of interest to the scholar. For the past 12 years, research has been in progress at Fritz Engineering Laboratory in the Department of Civil Engineering at Lehigh University. It is sponsored by a number of organizations including American Institute of Steel Construction, American Iron and Steel Institute, Column Research Council, Welding Research Council, and U.S. Navy Department. It began under direction of Bruce G. Johnson and has been headed by Lynn S. Beedle since 1950. Associates in this work have been Driscoll, Jensen, Ketter, Knudsen, Schutz, and Thurlimann. Active in support of the program are T. R. Higgins and Edward R. Estes, Jr., of American Institute of Steel Construction. During this 12-year period theories were advanced, checked by full-scale tests and formulated as design procedures. Most of these results have been published in proceedings of professional societies. Long awaited for the use of the design engineer have been a textbook of theory and design, and a design manual. These have now been written by the men who have been most active in bringing this new science to the point of general application.

Plastic Design in Steel. *American Institute of Steel Construction, Inc., 101 Park Ave., New York, N. Y., 1959. 74 pp. $4*

This is a reference manual for those who will use plastic design in practice. It summarizes in brief and usable form the theory and findings of plastic design studies such as will be found discussed more exhaustively in Beedle's book *(below)*. It establishes a new structural vocabulary. The designer now finds that he will use many new terms like shape factor, plastic hinge, mechanism, plastic bending moment, and plastic modulus. Design recommendations and reference tables and charts are included.

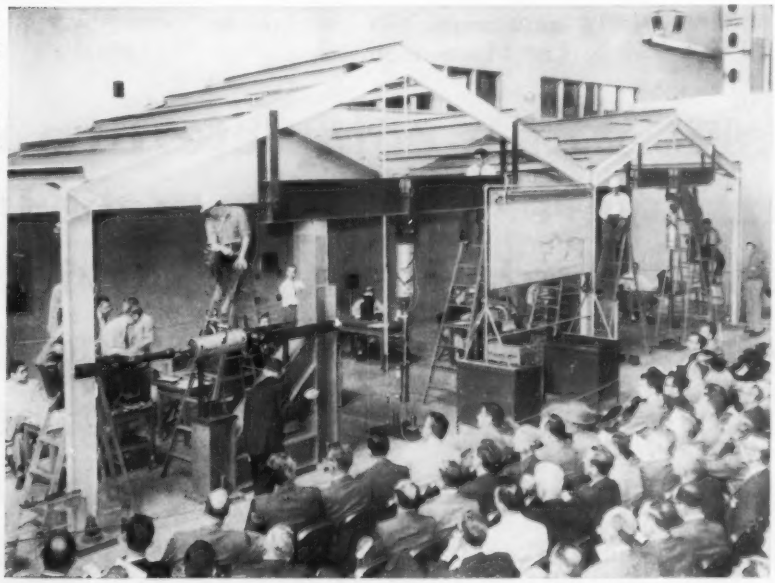
Subjects include plastic theory applied to bending, methods of analysis, effect of axial load on bending resistance, shear and web crippling, bracing requirements, non-symmetrical sections, haunched connections, design of continuous beams, design of single-span rigid frames, and design of multi-span rigid frames. The appendix includes rules for plastic design and fabrication, beam charts and formulas, frame charts and formulas, and plastic moment table.

The subject is liberally explained by many design examples and the details of such things as connections that are suitable for the new method. In time, *Plastic Design in Steel* is likely to become as familiar as the long-established *Steel Construction Manual* of the American Institute of Steel Construction. Indeed it may properly be considered as an extension of this reference book, which is in no way superseded by the new work.

Plastic Design of Steel Frames. *Lynn S. Beedle. John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y., 1958. 406 pp., illus. $13*

It is appropriate that in this, the first book written in the United States that deals entirely with the topic, *plastic design of steel frames*, Dr. Beedle explains what plastic design is. It is an "Advantageous replacement for conventional elastic design as applied to statically loaded structural steel frames of certain types." It applies only to statically indeterminate beams, members, or frames. This limits it largely to structures which are continuous through support-points, usually fully welded. Plastic design takes advantage of the fact that steel is a ductile material and remains strong even after it may have yielded slightly at certain controlled points. It is much

(Continued on page 200)



American Institute of Steel Construction

Full-scale tests at Fritz Engineering Laboratory, Lehigh University, check design procedures for plastic design of steel frames (left).

* *Chairman of Department of Structural Design, School of Architecture, Pratt Institute, Brooklyn, N. Y.; P/A Contributing Editor.*

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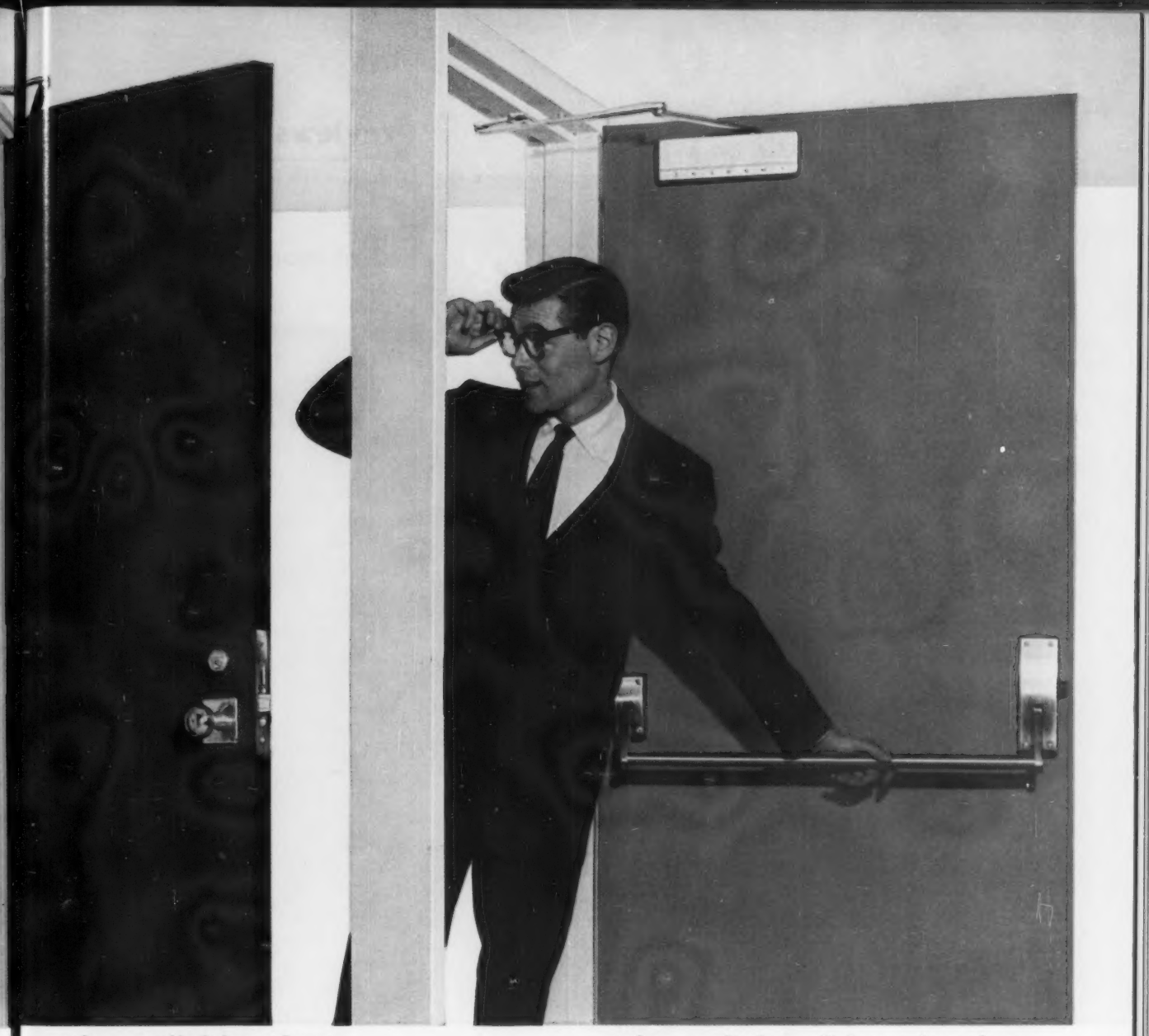

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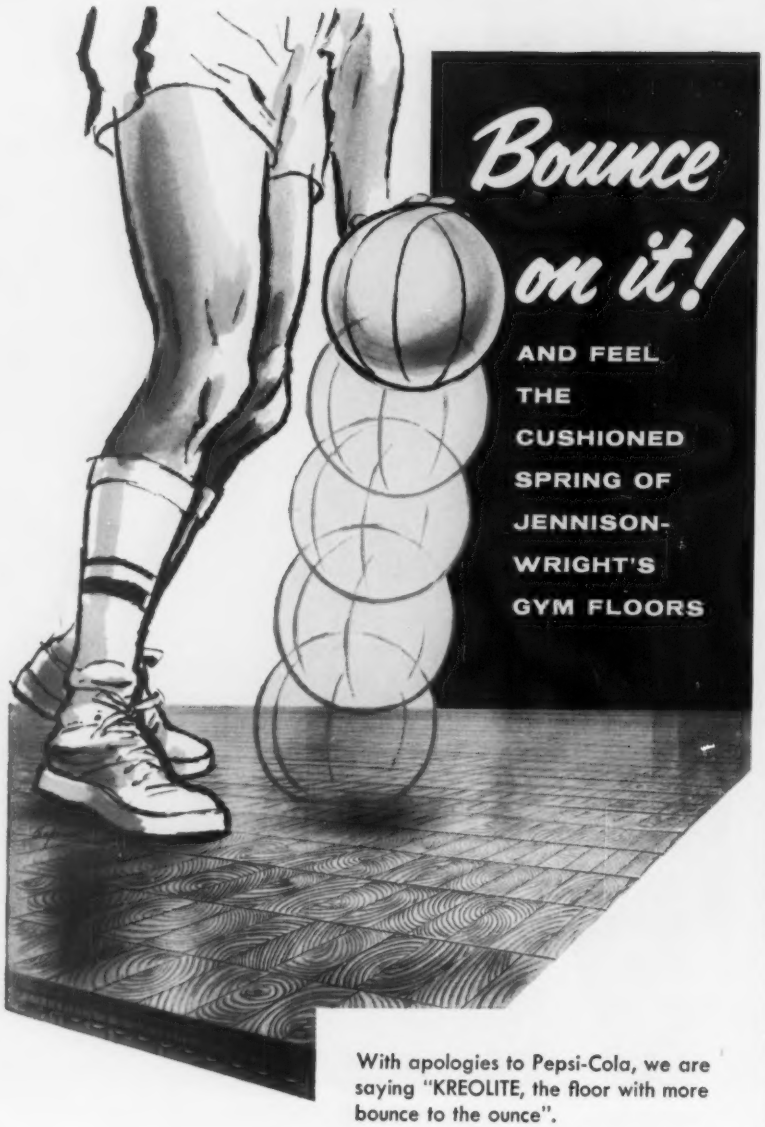

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reviews

(Continued from page 197)

nearer to the truth about the behavior of continuous frames than the elastic theory which has been its predecessor. At the end of Chapter 1, the author summarizes the "Case for plastic design."

1 Plastic design gives promise of economy in the use of steel, of saving in the design office by virtue of its simplicity, and of building frames more logically designed for greater over-all strength.

2 The reserve in strength above the working loads computed by conventional elastic methods is considerable in indeterminate steel structures. Indeed, in some instances of elastic design, as much load-carrying capacity is disregarded as is used.

3 Use of ultimate load as the design criterion provides at least the same margin of safety as is presently afforded in the elastic design of simple beams.

4 At working load the structure is in the so-called elastic range.

5 In most cases, a structure designed by the plastic method will deflect no more at working load than will a simply supported beam designed by elastic methods to support the same load.

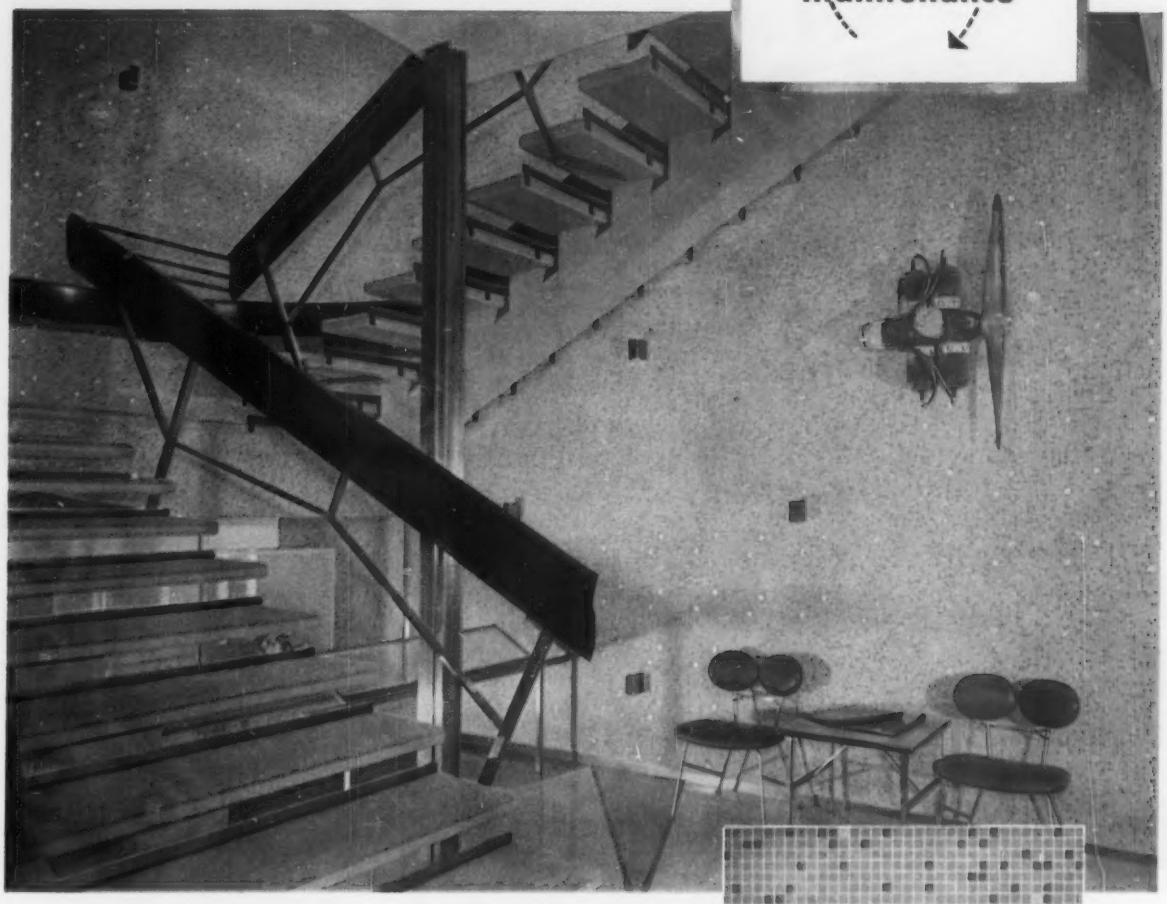
Of the nine chapters, six are devoted to basic theory and three to the application of this theory to the design of structural members and frames. The chapter subjects are: Introduction (The case for plastic design); Flexure of Beams; Analysis of Structures for Ultimate Load; Secondary Design Problems; Connections; Deflections; Design Guides; Continuous-Beam Design; Steel-Frame Design.

Owners of proposed buildings that are to be of continuous-steel frames are entitled to expect that plastic design will be used. Beedle has written a book which can serve as a text and reference for engineering offices that undertake to use the new method. The book presupposes that the reader has a knowledge of indeterminate structures. It will be useful not only in professional offices but also as a college text.

(Continued on page 208)

showroom in **Suntile** ceramics

combines modern, colorful design with low-cost maintenance



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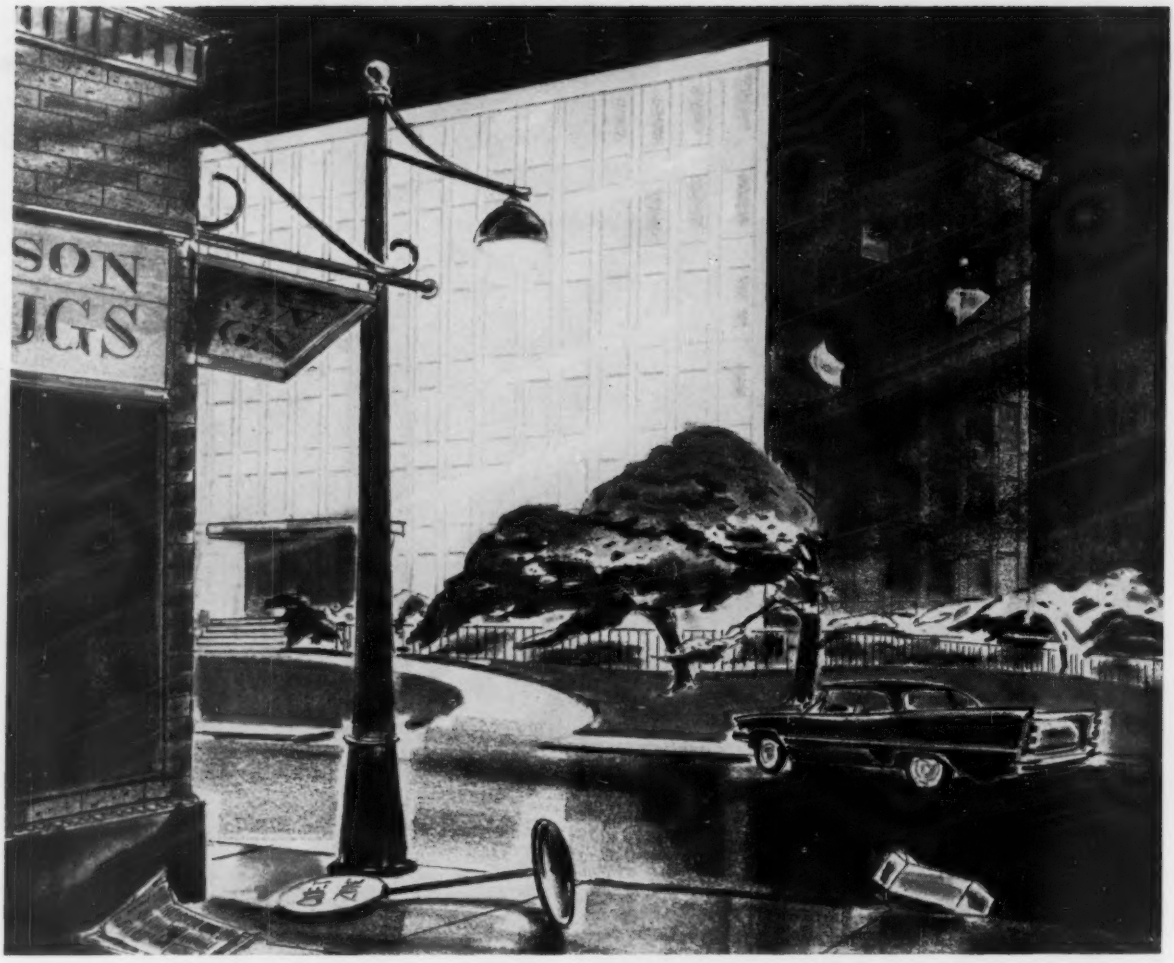

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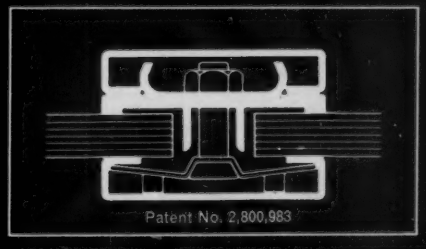

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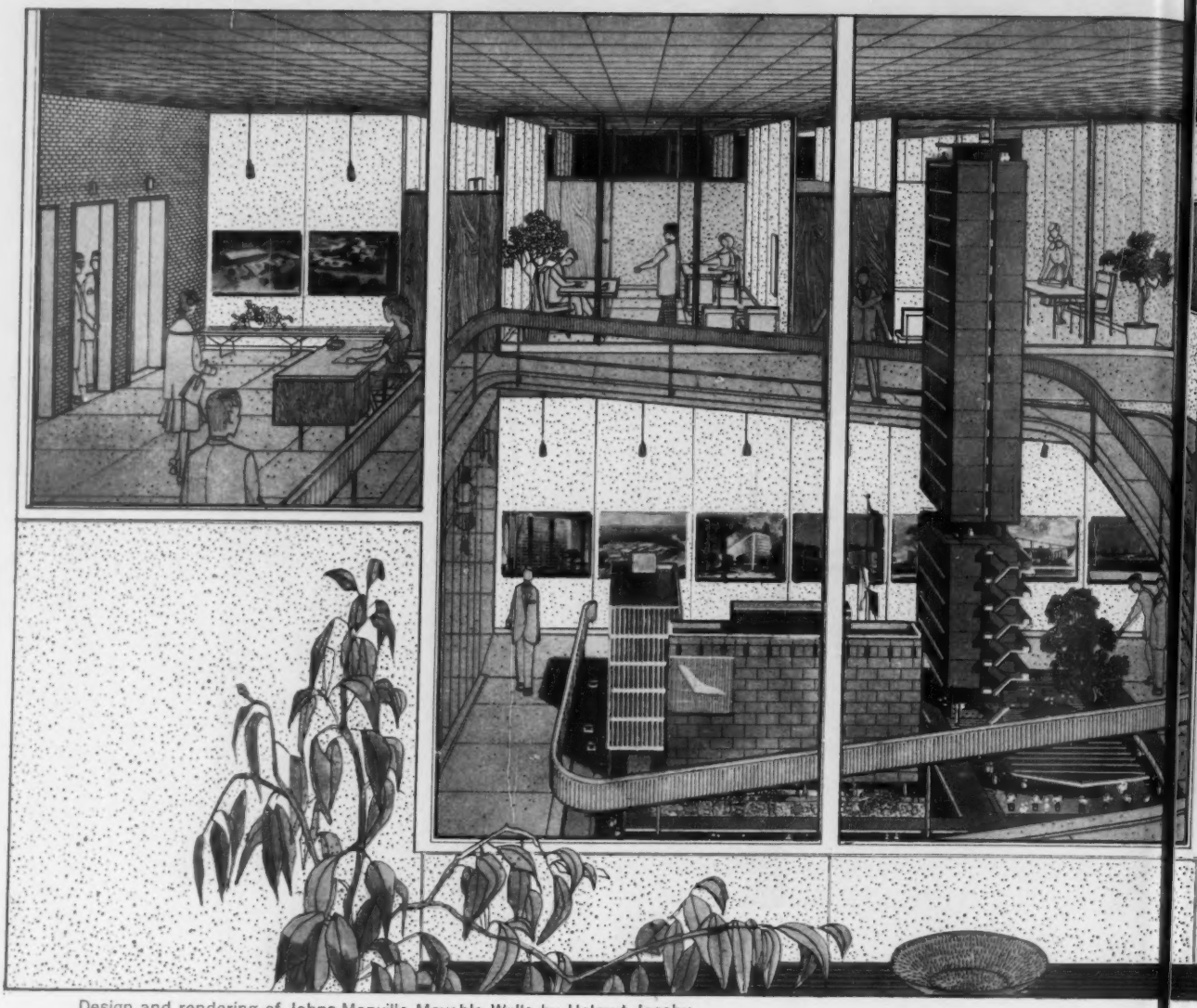
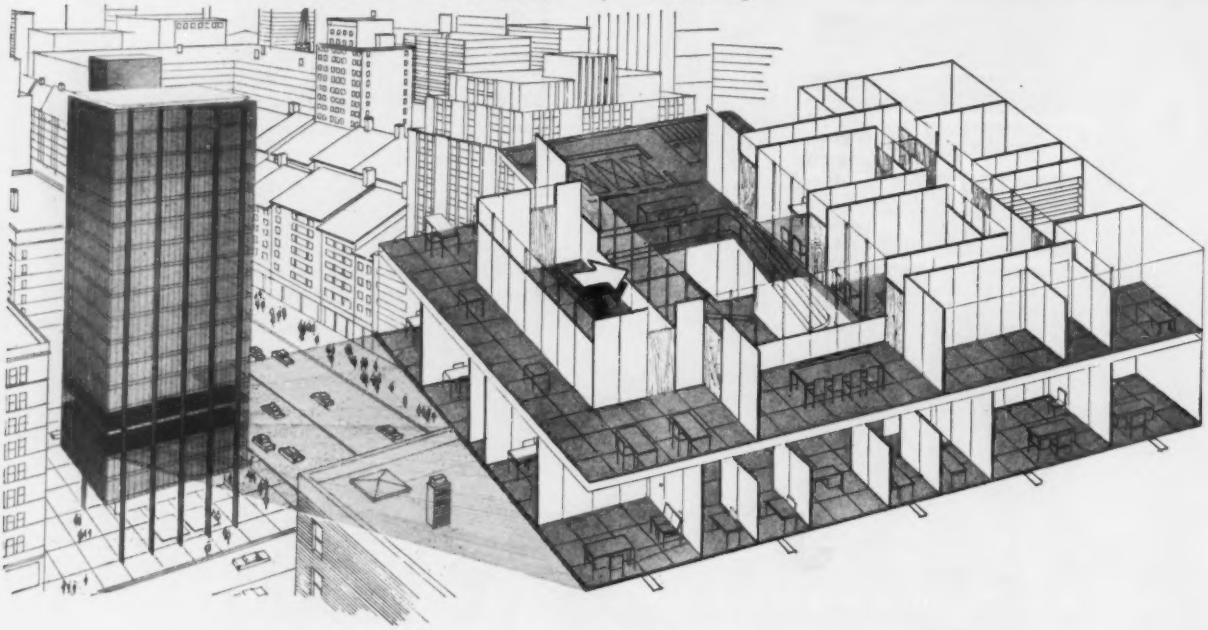
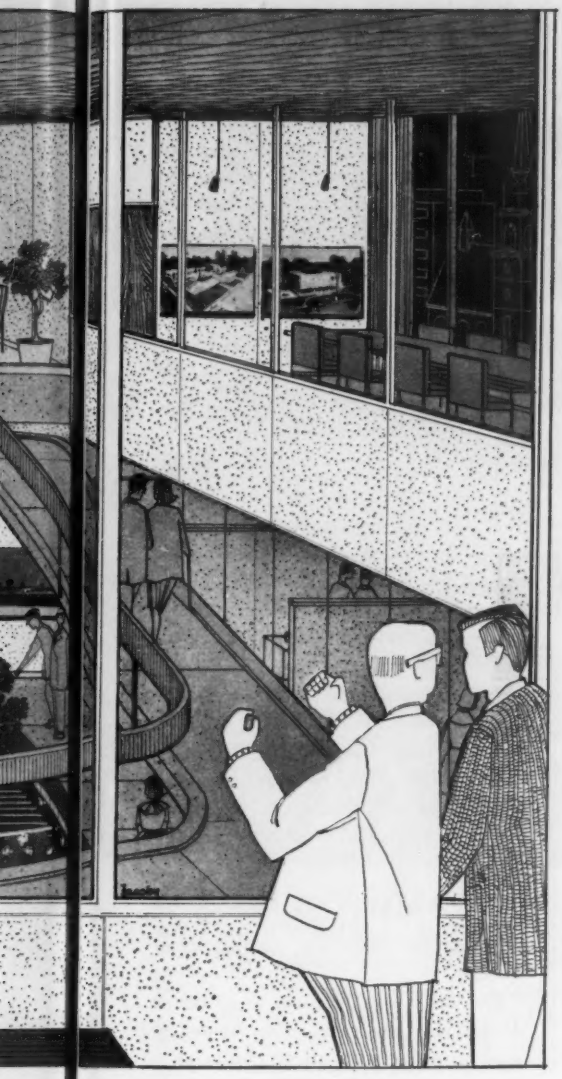


Design and rendering of Johns-Manville Movable Walls by Helmut Jacoby





In this office two types of J-M Movable Walls are used—Imperial and Class A

J-M Imperial Movable Walls—asbestos panels attached to slotted steel studs provide great versatility. These walls can be carried to heights of 20′ and higher. Thickness can vary from 3⅛" upward to suit unusual designs or out-of-the-ordinary service lines.

J-M Class A Movable Walls—prefabricated panels with a non-combustible core, asbestos-faced on both sides. Panels are erected independently and are completely interchangeable with panels of the same dimension. The walls are 1¾" thick and provide concealed wireways.

J-M Sanacoustic® units make up the acoustical ceilings, and J-M Terraflex® Vinyl Tile covers the floors.

Walls that grow with you

This project shows a real estate office requiring specialized space divisions and provision for the future.

The happy answer:

JOHNS-MANVILLE MOVABLE WALLS

This is the proposal given an architectural designer:

A large real estate firm has rented two floors in a new contemporary office building. There are to be executive offices, for president and vice presidents—also different-size conference rooms and interviewing rooms for representatives. An interesting "must" is provision for attractive display of large architectural models, photographs and renderings.

Walls are to be movable to provide for growth and expansion. They are to have glass areas to provide good visibility for the models and renderings.

To meet these varied requirements, the designer planned the offices around an open two-floor vertical space surrounded by a ramp. As for space division, he turned to a natural solution—J-M Movable Walls.

These walls come in modular units and are offered in several types. All can be used together, are erected easily, and can be readily relocated as needs change. Units are furnished with a stippled finish or they can be veneered in many ways. Also, they can be redecorated easily whenever a new look is desired.

J-M Movable Walls are supplied and installed complete with all items such as doors, hardware, trim and glass by trained J-M construction crews.

For illustrated brochure, write to Johns-Manville, Box 158, New York 17, N.Y. In Canada, Port Credit, Ontario.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

reviews

(Continued from page 200)

industry revealed

Precast Concrete in the Soviet Union. *E. Krimsky. Foreign Languages Publishing House, Moscow, 1958. 112 pp., illus. $.75. Available from Four Continents Book Corp., 822 Broadway, New York 5, N. Y.*

This small, soft bound, badly printed, execrably illustrated, poorly papered, and flaccidly translated book is continuously fascinating from beginning to end: one of the practically standard anomalies of imports from the Soviet Union. The package is so minimal that it seems less than amateurish, but the content is absorbing.

No attempt will be made below to draw any comparisons with U.S. data on concrete. For one reason, that is not the point of this review; for another, it is impossible with the source of material at hand: *The Statistical Abstract of the United States.* The latter's data in the field of production contains not the slightest hint of how much this country produces—only how much it is worth. (This is an effective way of concealing inflation and giving a false impression of expanding production.) The Soviet book does not mention a ruble from page 1 to page 112. It does mention (in millions of cubic meters):

	1950	*1956*	*1957*
concrete & reinforced concrete,	13.9	47.1	50.0
of which precast concrete was	1.3	9.0	13.1

which is a very meaningful statistic, even though the figures for 1957 are given as approximate. As the book puts it, "During seven years, the volume of precast concrete increased 10 times, while its share in the entire volume of concrete and reinforced-concrete work increased from 9.2 percent to 26 percent." A cubic meter is 1308 cubic yards. This compares (if dollars and cubic yards can be compared, which they cannot, of course) with the *Statistical Abstract*, data, as follows:

concrete & plaster products	1947: $346,751,000
	1954: $705,513,000

which means essentially nothing as it stands.

But this is not the place to go into a discussion of statistics. What Krimsky's book presents, with all its faults *as a book*, is an exemplary bird's-eye view of a huge and rocketing industry in the U.S.S.R. The data on concrete and reinforced concrete are in outline form and really only for background. What is given in useful and sometimes startling detail is the growth, both gross and in terms of increasingly wide application, of the precast concrete industry, covering both reinforced and prestressed materials. Many examples are given of new and unusual (to us) uses of the precast concretes, ranging from railroad ties and handsome brise-soleil fence sections reminiscent of Ed Stone's lacework, to prestressed, reinforced-concrete segments for lining subway tunnels, and huge, prestressed, thin-shell roofs measuring 40 meters square. They build precast-concrete bridge spans in "blocks" (the spans when assembled are 150 meters

(Continued on page 210)

Dodge Cork Tile in Display Area, National Housing Center, Washington, D. C. Architect, Aubinoe-Edwards-Berry. Installed by John Hampshire, Inc.

5 REASONS WHY YOU CAN USE

dodge Cork Tile ANYWHERE

1. HUSHES FOOTFALLS. Most quiet underfoot of any smooth-surface floor covering. It's softer, more resilient, has 98% indentation recovery.

2. BLENDS BEAUTIFULLY. Dodge *genuine* cork tile's 3-dimensional texture and natural, random shades blend with almost any color scheme. You choose from 34 patterns in three types.

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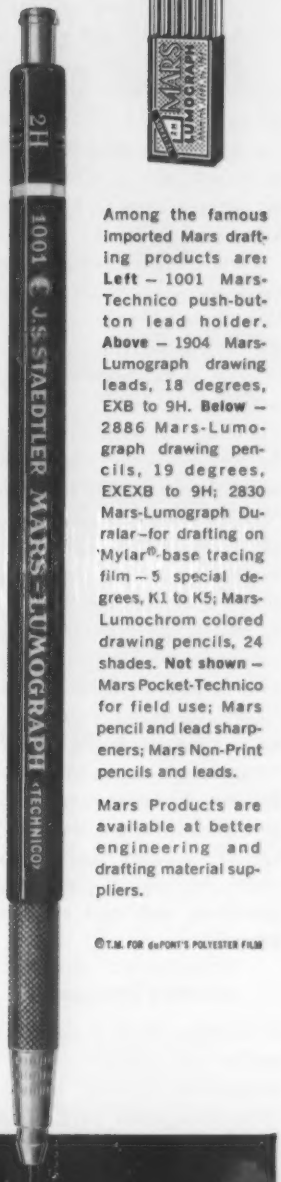
No. 15 • Mars Outstanding Design Series

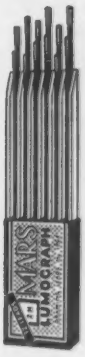
NO COLUMNS! In an unorthodox application of stress principles to multi-story construction, Architect Seymour Rutkin of New York has eliminated encumbering columns, achieved maximum space flexibility.

His office building of the future is supported by a concrete arch, and unified by circularly wrapped high tension steel cables which also hold the circular concrete floor slabs in compression. At areas of joining both floor slabs and arch are thickened and reinforced in generally three directions to resist moments and rotation about areas of arch support. Concrete is used in compression and steel in tension, as completely as possible. The cylinder in the center of the building is non-structural, acting as a mechanical core for elevators, plumbing, etc.

This ingenious departure from precedent is another example of the contribution today's designers are making. In translating their pace-setting ideas from concept to reality they require the best of drafting tools.

In pencils that means MARS, long the standard of professionals.





Among the famous imported Mars drafting products are: **Left** – 1001 Mars-Technico push-button lead holder. **Above** – 1904 Mars-Lumograph drawing leads, 18 degrees, EXB to 9H. **Below** – 2886 Mars-Lumograph drawing pencils, 19 degrees, EXEXB to 9H; 2830 Mars-Lumograph Duralar–for drafting on 'Mylar®-base tracing film – 5 special degrees, K1 to K5; Mars-Lumochrom colored drawing pencils, 24 shades. **Not shown** – Mars Pocket-Technico for field use; Mars pencil and lead sharpeners; Mars Non-Print pencils and leads.

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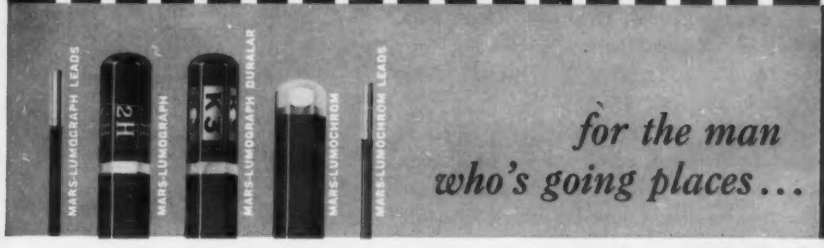

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reviews

(Continued from page 208)

long) and trusses of 30-meter span and greater. Especially interesting to this reviewer are their great multicore prefabricated floor, wall, and ceiling panels for multifloor apartment houses. They are precasting complete room-size concrete blocks in the U.S.S.R.—believe it or not—and they are using lightweight aggregates, insulated panels, and so on with considerably more sophistication than we have as yet achieved.

Their crane technology surpasses anything we have, making installation of these huge pieces of concrete a simple mechanized operation. Note their cantilever crane as shown on page 56 of this book.

As Krimsky organizes his arguments for precasting, they can be summarized as follows: precasting can be done under roof on a year-round basis, regardless of the weather; precasting lends itself beautifully to the establishment of standard prefabricated house and other structural parts; and precasting makes possible a very high standard of product quality because it is produced under rigidly controlled conditions. Furthermore, prestressing of precast parts is being strongly emphasized in the U.S.S.R. because it saves so much steel. (A government decision in 1954 indicated specific structure and building types where the use of precast concrete is mandatory and steel construction prohibited.)

moisture safeguards

Protection from Moisture for Slab-on-Ground Construction and for Habitable Spaces below Grade. *(NAS-NRC Publ. 707). Building Research Advisory Board, National Academy of Sciences—National Research Council, 2102 Constitution Avenue, Washington 25, D. C., 1959. $1.50*

A valuable report on moisture protection needed for concrete slabs on or below grade and for habitable spaces below grade has been completed by the Building Research Advisory Board, as part of its advisory services to the FHA. Seeking authoritative answers regarding the nature and degree of moisture protection, the report considers the fundamentals of moisture behavior in soils, insulation, concrete, and flooring. It also draws attention to the sources of moisture, especially the seepage of surface water through foundation walls. In addition, analysis is made of the service life expectancy of vapor barriers used with slab construction. The study was under the direction of Frank A. Joy of the Pennsylvania State University.

The book not only outlines the uses to which precast concrete is being put, but also the standards used in selecting raw materials, types of factories making the concrete (including flow line-conveyor, flow line-unit, autoclaves, and, for special work, casting yards), and methods of transportation and erection of the precast units.

House builders, in particular, should be interested in the extent to which the Soviets have advanced their technology in terms of wall and floor-ceiling sections, precast with plumbing, electrical conduits, and heating sections already in place. Many of these standard "concrete blocks" are dimensioned so that two blocks equal a room height, although they are made in various other sizes as well, of course, including the 8′ high units previously mentioned. They even build precast-concrete incinerator chute wall sections! With such industrialization of building operations, it is hardly surprising that fabrication's share of new housing has already risen about 50 percent in major cities.

GROFF CONKLIN
New York, N. Y.

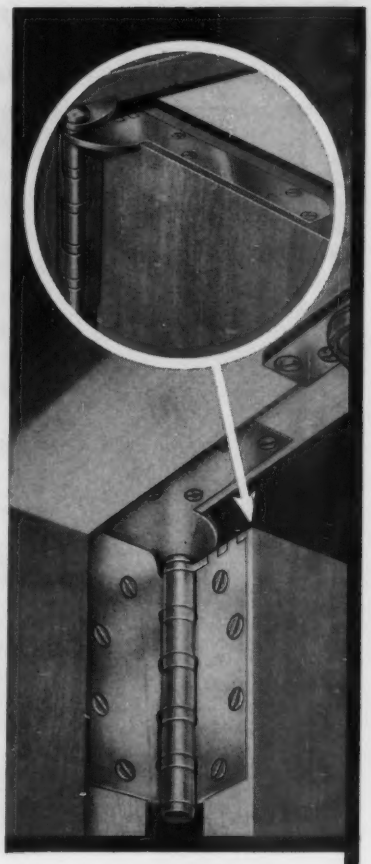
first principles

Techniques of Painting. *Henry Gasser. Reinhold Publishing Corp., 430 Park Ave., New York, N. Y., 1958. 128 pp., illus. $6.95*

On the Art of Drawing. *Robert Fawcett. Watson-Guptill Publications, Inc., 24 W. 40 St., New York, N. Y., 1958. 136 pp., illus. $10.00*

Gasser presents an important aspect in the study of painting when he stresses the need of seeing a subject in more than one way. By combining composition with technique, as shown in case histories developed from the spot sketch to the finished studio interpretation, he illus-

(Continued on page 212)



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Two hinges
in ONE!

It takes a special kind of hinge to stand up to the punishment dealt out when overhead holders bring exterior doors to sudden halts. The new STANLEY full jeweled ball bearing PIVOT REINFORCED HINGE* *is* something special . . . two hinges in one . . . combining a pivot and butt hinge in one unit, in which they share the same pin to assure perfect alignment.

Interlocked corners prevent individual sidewise motion of either pivot or butt leaves, so that strain is shared equally by both.

Interlocked corners and mutual pin permit locating the screw holes to improve fastening and minimize the danger of splitting the door parts. For details write:

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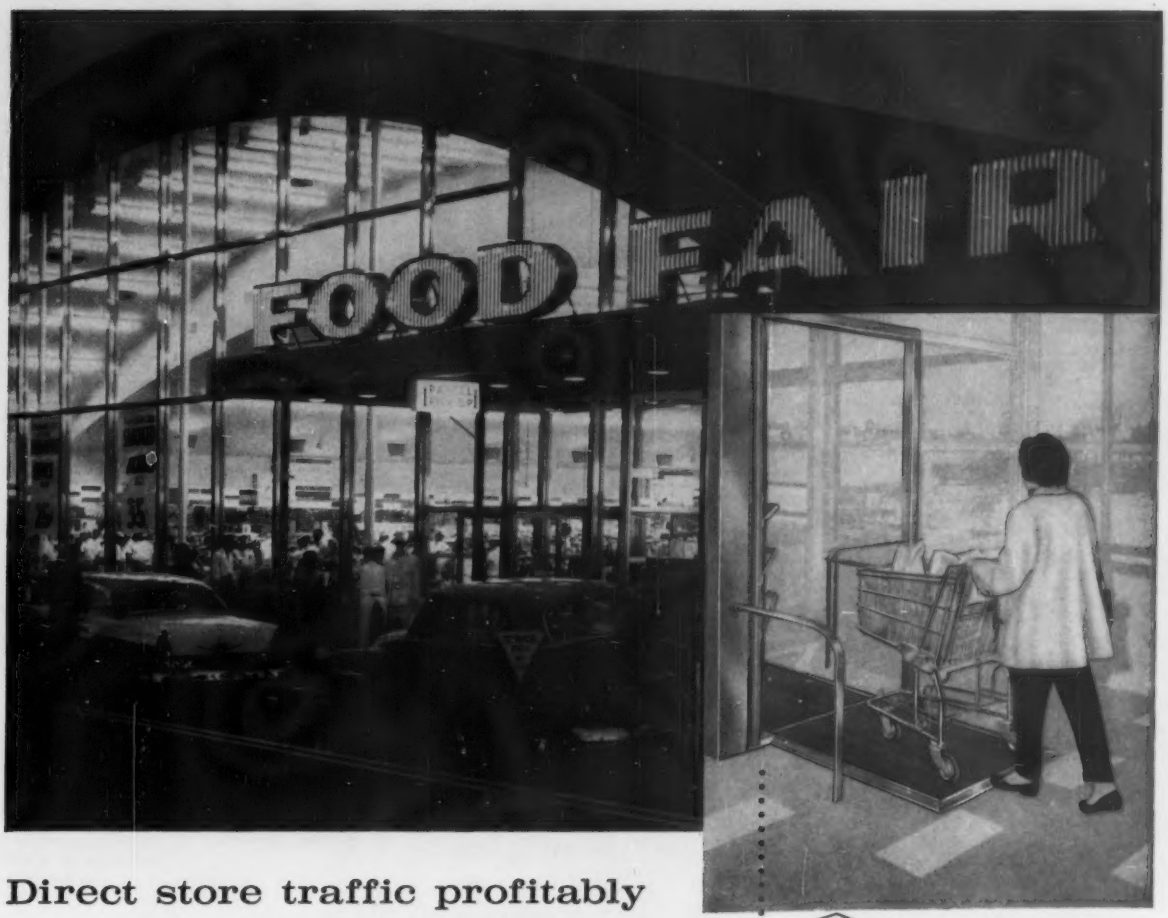

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- ***Reduced damage to doors and baskarts***
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- ***Conservation of conditioned air because doors stay open only the minimum time required***
- ***Added customer convenience that guarantees greater customer satisfaction.***

Rely on the name that has stood for leadership in the automatic door opening field since 1932—STANLEY Magic-Door. There's a Magic-Door distributor nearby who will provide complete engineering service. Magic-Door controls can be installed on new—or existing—doors.
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The No. 1 plant provides power for heating and ventilating, stage switchboard, swimming pool lighting. Special switch gear enables an operator to concentrate full lighting in specific areas, such as theatre or gymnasium during performances. The No. 2 plant provides emergency lighting throughout the building at 5 to 10 percent of capacity. Sizes to 100 KW, gas or gasoline, and diesel. Complete manual with suggested specifications sent on request. Write Dept. D-64.

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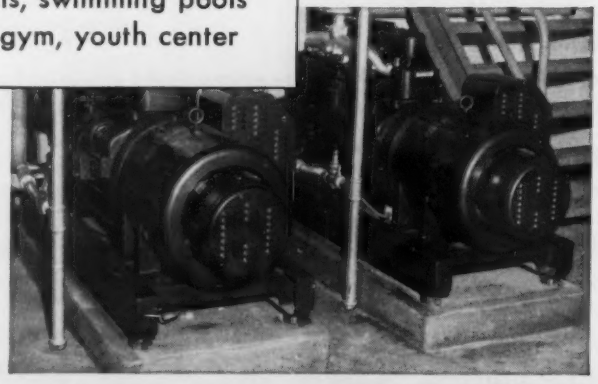

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reviews

(Continued from page 210)

trates how the artist arrives at a certain composition, achieves specific color effects, builds up textures, and uses one medium to help another, from the initial "idea" to the finished painting. Technical demonstrations of direct painting, under-painting, glazing, and imprimatura methods are all illustrated in full color.

Techniques of Painting is a well-presented compilation of emphasis, variations, and details to help the student find the best expression for his own personal mood in oil, watercolor, gouache, charcoal, ink, casein, and pastel.

On the Art of Drawing is a provocative and controversial book that attempts to take the mystery out of drawing. The author undertakes to explain drawings as an all-embracing subject, not split up into various categories, and illustrates his theories with an abundance of personal drawings.

The main theme of this book is a plea by Fawcett for a return to the period of rigid training, which he believes has been too long ignored.

ELEANOR M. WOLFE
New York, N. Y.

better readability

Heating Ventilating and Air Conditioning Guide. *Volume 37. American Society of Heating and Air Conditioning Engineers, Inc., 62 Worth St., New York, N. Y., 1959. 1268 pp. $12*

A dramatic and very practical improvement in this 37th annual edition of the *HVAC Guide* is at once evident to the most casual user: the page size is now 8½"x11", as against the squat 6"x9" of previous years. This major enlargement has resulted in a decrease in the number of text pages from 1272 to 768; a shorter type line in two columns (and a smaller text type size thus made possible) with an actual and marked improvement in readability; dozens if not hundreds of complex tables and charts published all on one page rather than across two or more; tables generally the same type size as the text—rather than eye-straingly small—and all usable without turning the book 90 degrees to read, as used to be the case with many of the more complex ones;

(Continued on page 214)

Acoustical treatment
can be decorative as well as functional

Sound-control that pleases ears and eyes

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The ideas you conceive are easy to achieve when you control sound with Milcor Metal Lath and acoustical plaster. There are few limitations.

Milcor Metal Lath can easily be formed into curved and irregular surfaces. When acoustical plaster is applied, function is combined with beauty of form and texture.

For jobs like these and many others, there's a Milcor Metal Lath that meets your requirements exactly. Milcor has the industry's most complete line of metal lath, corner beads, casing beads, stools, bases, coves, and accessories. See Sweet's, section 12a/In — or write for catalog 202.

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ML-25

Member of the INLAND Steel Family

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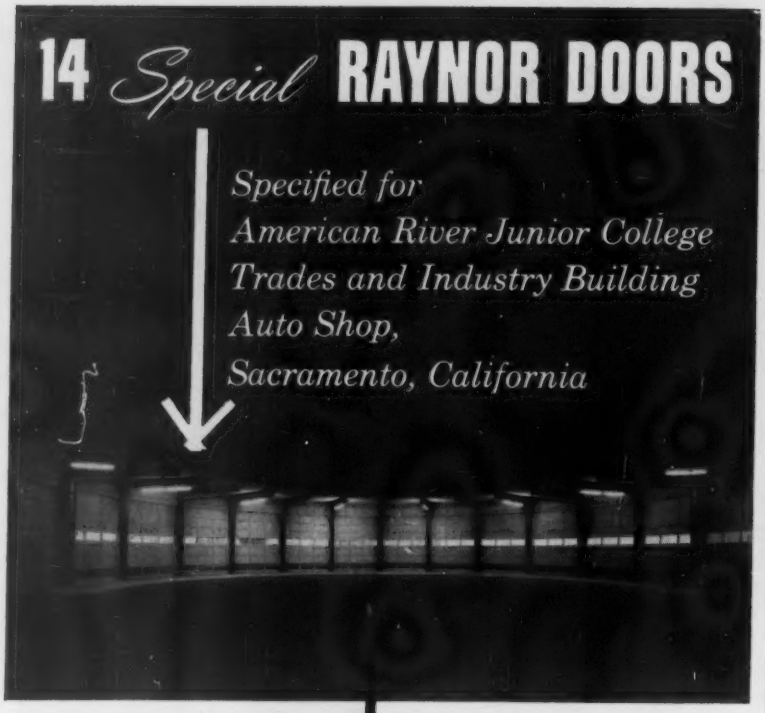
14 *Special* RAYNOR DOORS



ARCHITECTS:	Barovetto and Thomas
CONTRACTOR:	Erickson Construction Co.
SPONSORING CONTRACTORS:	Heller — Campbell — Erickson — Lawrence
DOORS BY:	Valley Overhead Door Co. Carmichael, California

The eye appeal and versatility of Raynor Doors highlight the circular design of the American River Junior College Auto Shop shown above.

The perfection with which Raynor Doors so completely create the desired effect and meet the exacting specifications of outstanding architectural designs such as this, is accomplished through *Raynor Advanced Sectional Door Engineering Know-How.* Built complete under one roof, Raynor Doors embody only the finest materials available . . . employ construction features such as exclusive "Graduated Seal" . . . three-way stress construction . . . heavy-duty galvanized hardware and "Lifetime Guaranteed" Dorlux panels.

Whatever your specific design problem may be, the Raynor Engineering Department will provide the correct solution. *Contact your nearest Raynor Distributor or write direct.*

RAYNOR MFG. CO.

Dixon, Illinois Hammonton, New Jersey

reviews

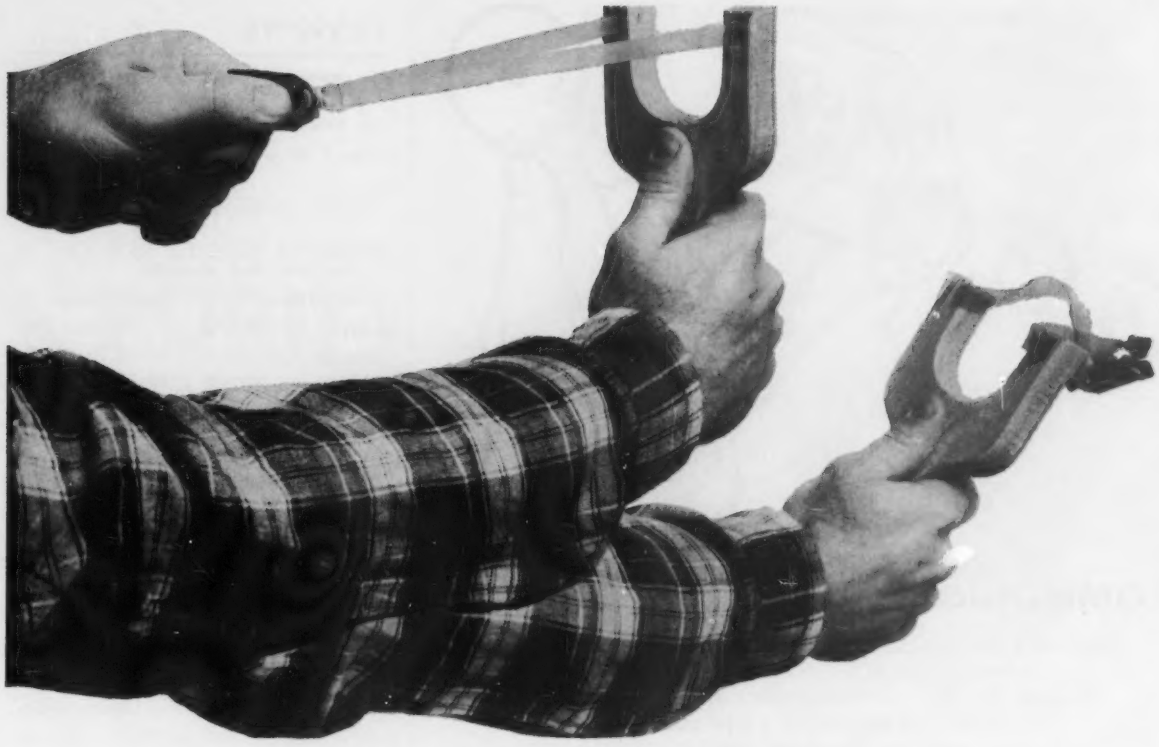
(Continued from page 212)

and, in general, a more open, easier-on-the-eye, and much easier-to-follow manual. Even the wider page margins greatly increase readibility.

On the other hand, the larger page size, which has also meant larger pages for the advertisements, has resulted in a pretty ponderous tome. The advertising pages have not decreased at all in number; and the result is that the 1959 *Guide* is just about the same size and weight as Merriam-Webster's India-paper Unabridged Dictionary.

The 1959 edition is new not only in format; great advances in a number of technical areas are also reflected in changes in the text pages. These changes are summarized in two pages of two-column small type in the Preface, and are far too numerous and too complicated for coverage in a brief review. Suffice it to say that in addition to putting through the monumental physical remake of the *Guide*, the staff, together with its many industrial and university advisers and contributors, has greatly amplified, modernized, and clarified the text and the illustrations. There are 286 new or revised charts and diagrams; and in almost every instance the pertinent chart or table is now within hailing distance of the reference to it in the text—something made possible by the "new freedom" of the larger page size. Five brief new chapters have been added, on subjects ranging from heat pumps to snow melting. The general organization of the table of contents has been greatly improved in several instances. For example, by the elimination of that catch-all section in previous *Guides*, "Special Systems," and the addition of several important and independent new sections (there are now 12 instead of 7). Innumerable smaller changes in organization and additions to content have smoothed out and made easier to refer to what is in any event a complex and difficult field of modern technical knowledge. The two Carls, Flink and his young assistant, McPhee, are to be congratulated on a major feat in intellectual engineering, indicated by the skill with which they have co-ordinated and streamlined

(Continued on page 216)



a short lesson in modulus control for users of Strucsureseal*

In the past, this question has belonged to the "how high is up?" category. You can't answer it until you've asked (and received answers to) certain other questions. For example: how thick is the sling material? How elastic? How far must it stretch?

And so it is in selecting a Presstite STRUC*SURE*SEAL . . . polysulfide base synthetic rubber sealants. We first have to know how it's going to be used, the amount of movement to which the joint being sealed will be subjected, and even local conditions of climate. Knowing these things, we can recommend the best, the *right*, STRUC*SURE*SEAL—and be sure of optimum performance.

STRUC*SURE*SEAL offers you this kind of modulus control: *predetermined elasticity to match your particular installation needs.* There's a STRUC*SURE*SEAL for use in normal expansion joints and for glazing. Then there's another for extreme movements, in cold weather. All are designed for maximum adhesion to dissimilar surfaces.

We will help you select the proper STRUC*SURE*SEAL for your requirements. Tell us about your problem. Our building construction technicians will be pleased to help you. Write, call or wire.

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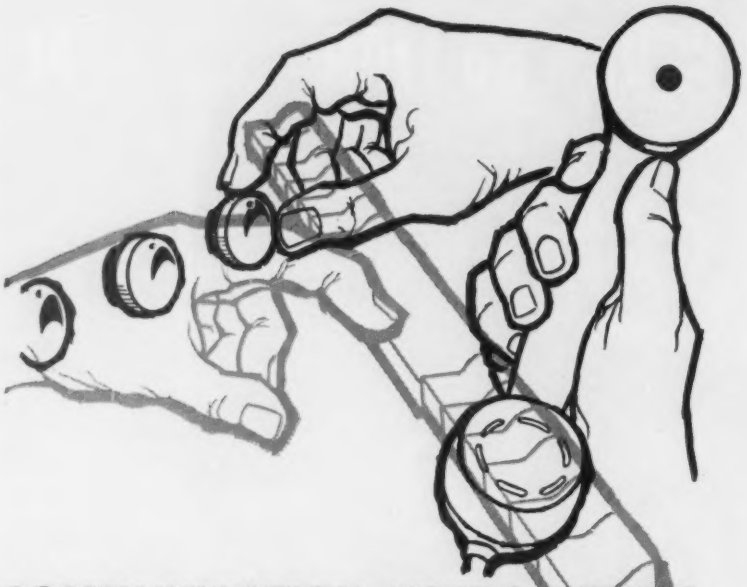

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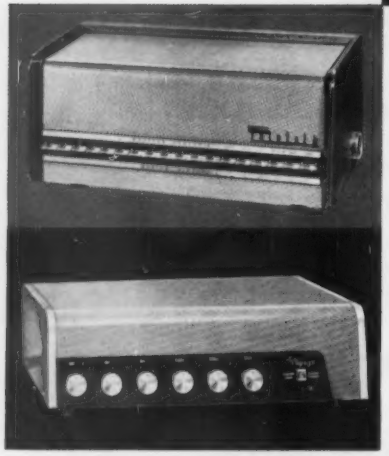

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reviews

(Continued from page 214)

the new *Guide* under the general direction of the *Guide* Committee.

GROFF CONKLIN
New York, N. Y.

doctors and designs

Psychiatric Architecture. *Edited by Charles E. Goshen. The American Psychiatric Association, 1700 18 St., N.W., Washington 9, D.C., 1959. 156 pp., illus. $10*

Anyone involved in programming and designing structures for the mentally ill should digest this book. But doing so is not easy. This volume is a compilation of papers given at several mental-hygiene design clinics and reprints of articles which have appeared in the American Psychiatric Association magazine. Consequently there is a great deal of repetition and a wide variety of literary styles.

Psychiatrists and psychiatric administrators are stating their program needs to architects, who in turn explain how the architect translates these needs into physical space. As a result one senses a slight case of split personality since the book is addressed to two audiences.

Goshen, as editor, aptly terms the aim of this cross-pollination to be "the development of effective communication between the two main professions concerned—psychiatry and architecture." His chapter, reviewing "Psychiatric Architecture and the Principles of Design," is a lucid statement of modern treatment programs and the design implications of "the open hospital." Dr. Humphry Osmond discusses the historical and sociological development of mental hospitals and the relationship between architect and psychiatrist. The psychiatric unit in the general hospital and the current concept of the "Day Hospital" are well reviewed.

The architectural problems posed by various psychiatric programs are thoughtfully discussed by Chloethiel Woodard Smith, AIA, and Vincent G. Kling, AIA. Architects will wish that more plans had been included among the illustrations. Certainly some included indicate there is wide opportunity for imagination to translate the psychiatrist's constantly re-

(Continued on page 220)

In Measuring Vinyl
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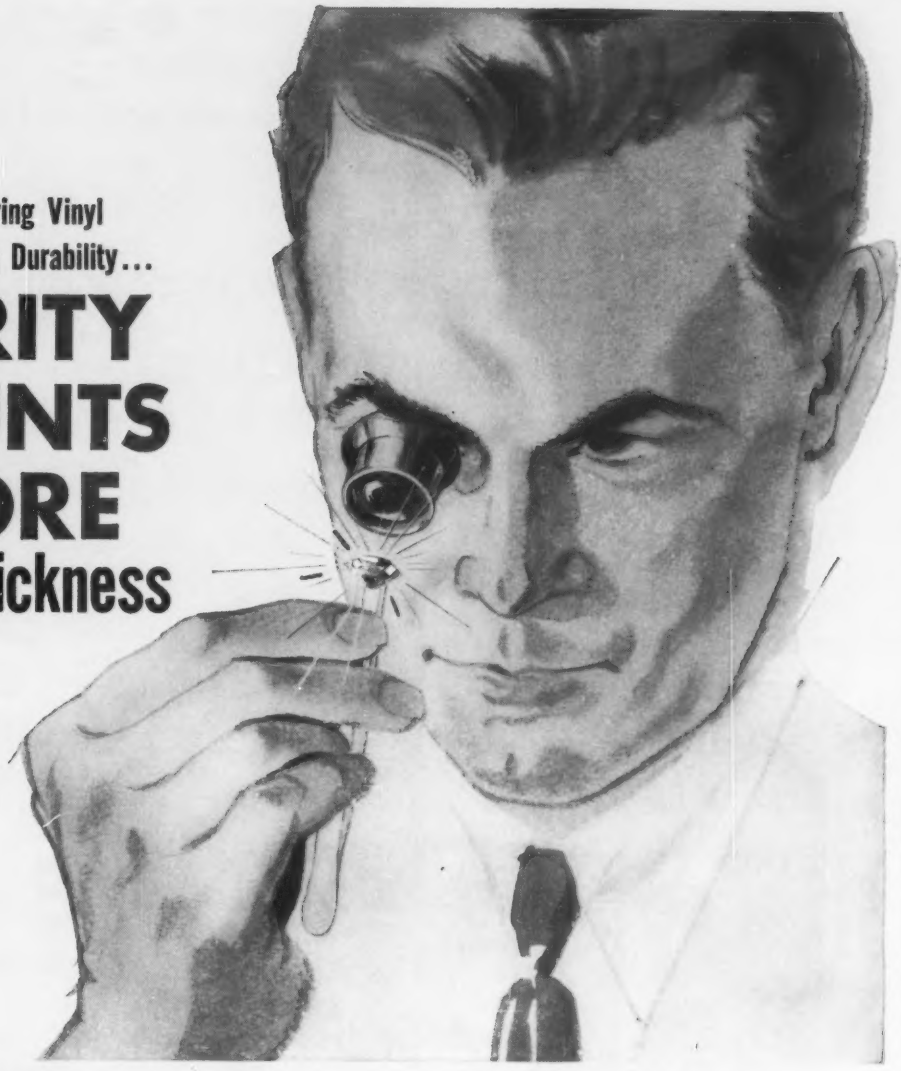

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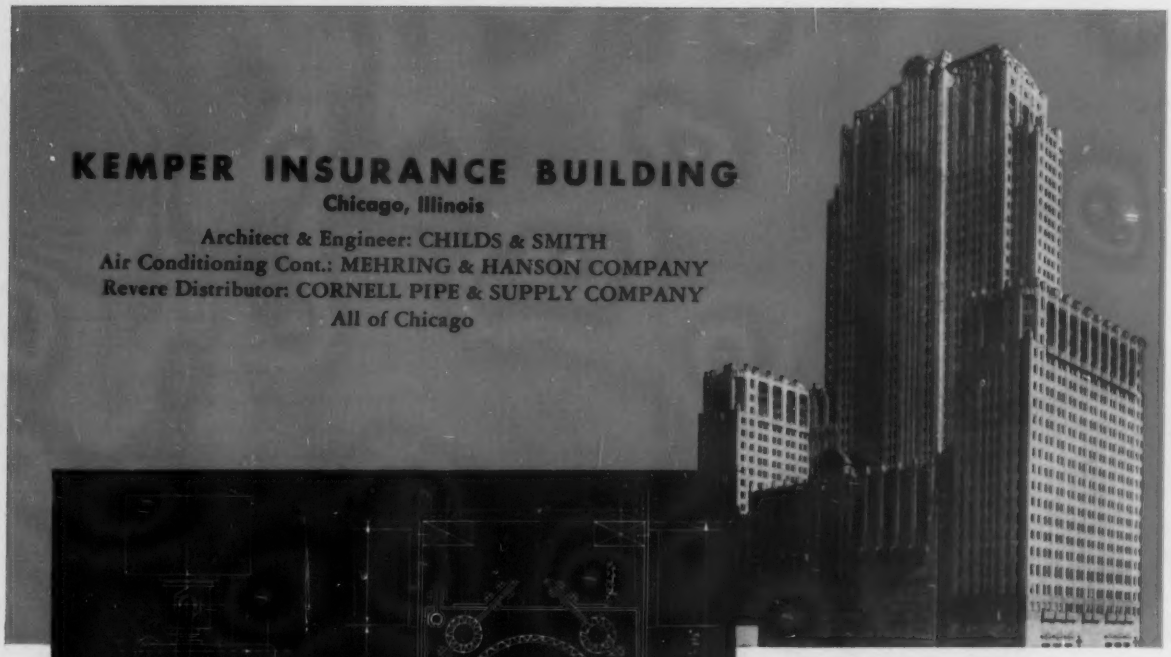

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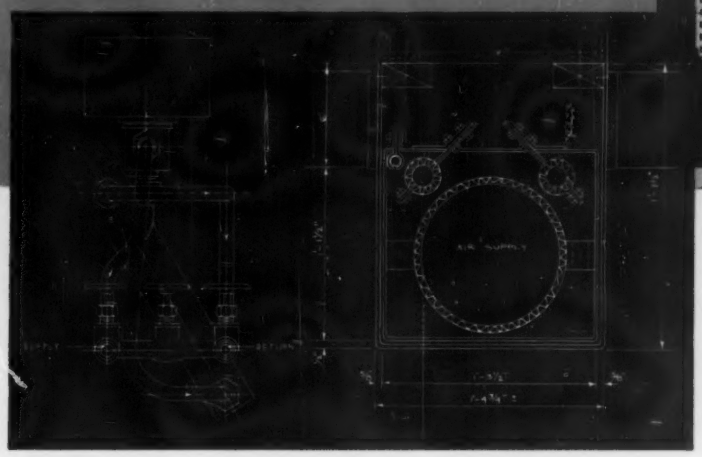

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reviews

(Continued from page 216)

iterated plea for the "homelike" atmosphere.

The review of mental health programs and facilities in Europe and Asia by Alston G. Guttersen, AIA, will be an eye-opener to many chauvinistic Americans. We can learn a great deal about the "open door" mental institutions being successfully operated abroad.

There seems to be a certain amount of padding in the volume. Discussions of laundry layouts, maintenance and soundproofing are out of place. A glossary of mental-hospital terms for architects may be helpful. Certainly the architects will get a laugh out of the glossary of building terms for mental-hospital administrators. It must have been copied cold from an 1890 builders' handbook.

But if you have any projects involving mental-health facilities, laugh at the glossary but ponder well the needs of the patients and of the psychiatric team responsible for their rehabilitation as set forth in this book.

MARY T. WORTHEN
New York, N. Y.

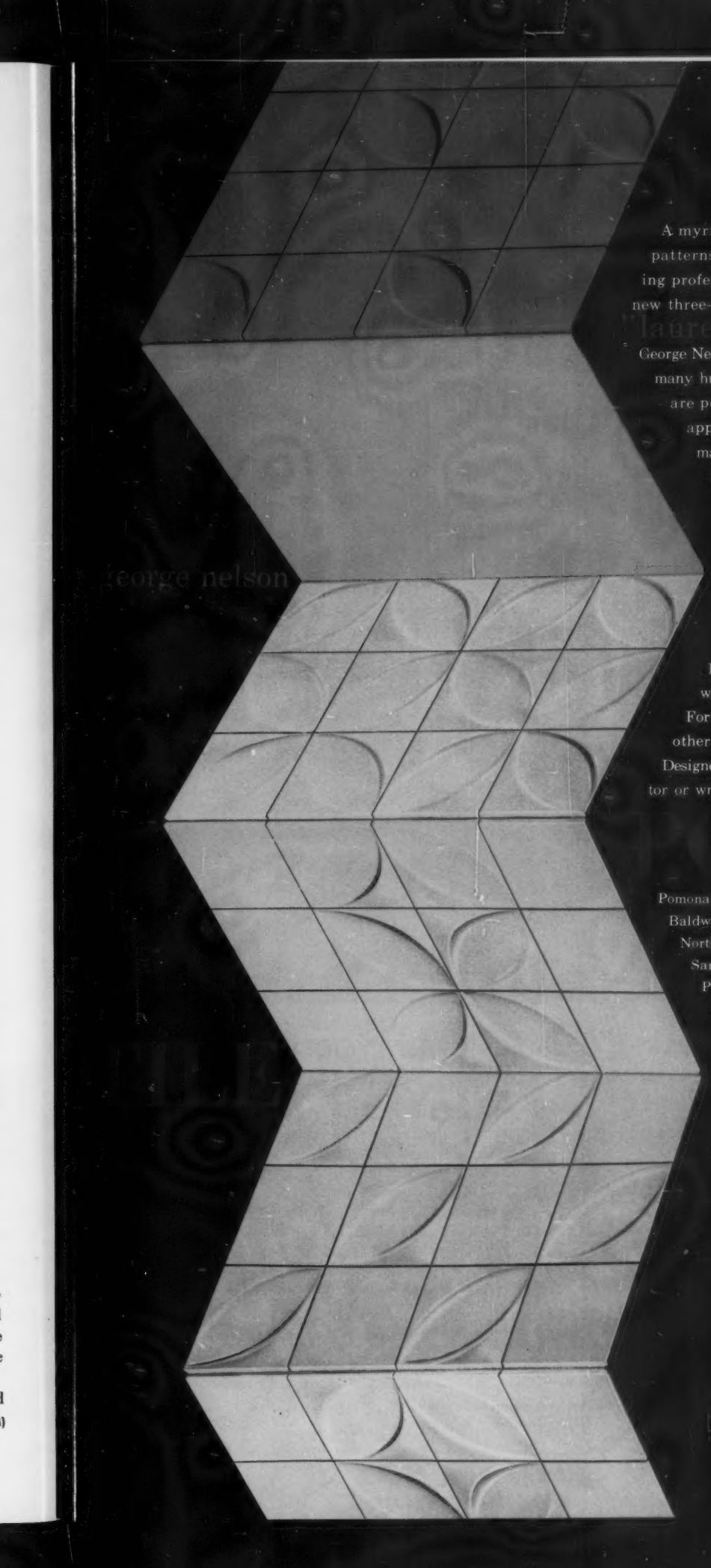
abstract expressionists

It Is: A Magazine for Abstract Art. *P. G. Pavia, ed., No. 3, Winter-Spring, Second Half Publishing Co., Inc., 22 E. 17 St., New York 3, N.Y., 1959. 80 pp., illus. $2*

Much improved in this, its third issue, *It Is*—as the house organ of abstract expressionism—still has the over-all character of a *Playbill* and an underground *Town and Country*, a combination scorecard and social register of the New York School. The mollifying elements here are the serious note injected by Editor Pavia's very difficult essay on the "new psychology" of abstract expressionism; a rather startling proposal on the symbolic, sexual significance of the abstract image, by Artist-Critic Hubert Crehan; and some notes on frontality in sculpture by Sculptor-Critic Sidney Geist. The latter may be of some interest to architects; the papers by Pavia and Crehan lack sufficient empirical evidence or, at least, the evidence of projective techniques.

Once more there is a gratifying spread

(Continued on page 224)



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reviews

(Continued from page 220)

of full-page reproductions, including three new color plates, but the offset reproduction is very poor. Economy undoubtedly dictated the use of what seems to be varitype for the texts; yet the makeup is a shambles. The "cahiers leafs" and statements by artists and writers and a hearsay panel reconstructed by Elaine de Kooning (four artists and a poet "turning each other on" in hipsterish fashion) are with an occasional exception snobbish, pretentious, and hostile—curious behavior for an "in" group. The din reminds one of those Dada conventions where all read their manifestoes at once. Certainly no one is paying attention to Mercedes Matter who writes in a brief article on drawing. "The door to experience, for a painter, is still the eye."

SIDNEY TILLIM
Contributing Editor
ARTS Magazine
New York, N.Y.

BOOKS RECEIVED

Joan Miro. James Thrall Soby. Museum of Modern Art, New York, N.Y., 1959. Distributed by Doubleday & Co., Inc., Garden City, N.Y. 164 pp., illus. $8.50

A Guide To The Architecture of New Orleans 1699-1959. Samuel Wilson, Jr. Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y., 1959. 80 pp., illus. $1.50 (paperbound)

Richard Neutra 1950-60. Buildings and Projects. Ed. Willy Boesiger. Frederick A. Praeger, Inc., 15 W. 47 St., New York 36, N.Y., 1959. 240 pp., illus. $15

Old Houses On Nantucket. Kenneth Duprey. Hastings House Publishers, Inc., 151 E. 50 St., New York 22, N.Y., 1959. 242 pp., illus. $12.50

The Synthetic Vision of Walter Gropius. Gilbert Herbert. Witwatersrand University Press, Milner Park, Johannesburg, South Africa, 1959. 48 pp., illus. 19s 6d

Oil Painting. Traditional and New. Leonard Brooks. Reinhold Publishing Corp., 430 Park Ave., New York, N.Y., 1959. 160 pp., illus. $7.95

Rubens' Drawings. Julius S. Held. Doubleday & Co., Inc., 575 Madison Ave., New York 22, N.Y., 1959. 2 vols., illus. $25

A Handbook Of Greek Art. Gisella Richter. Doubleday & Co., Inc., 575 Madison Ave., New York 22, N.Y., 1959. 422 pp., illus. $7.95

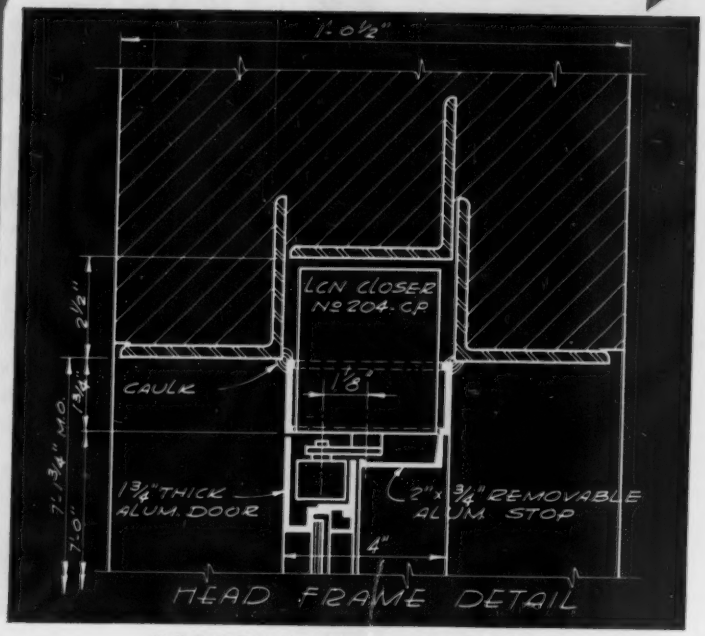
This is Japan 1958. The Asahi Shimbun, Yurakcho, Chiyoda-Ku, Tokyo, Japan, 1958. 419 pp., illus. $6.50 ($7.25, in cedar box).

Silk-Screen Techniques. J. I. Biegeleisen and M. A. Cohn. Dover Publications Inc., 920 Broadway, New York, N. Y., 1958. 188 pp., illus. $1.45 (paperbound)

Business and Specialized Publications of Great Britain. The Council of the Trade & Technical Press, London, 1958. Distributed free by the British Information Services, 45 Rockefeller Plaza, New York, N. Y. 112 pp. (paperbound). An index to trade periodicals.

Painting In Eighteenth-Century Venice. Michael Levey. Doubleday & Co., Inc., 575 Madison Ave., New York 22, N.Y., 1959. 226 pp., illus. $6.50

Scandinavian Architecture. Thomas Paulsson. Charles T. Branford Co., 69 Union St., Newton Centre, Mass., 1959. 272 pp., illus. $7.50. Buildings and society in Denmark, Finland, Norway, and Sweden from the Iron Age until today.



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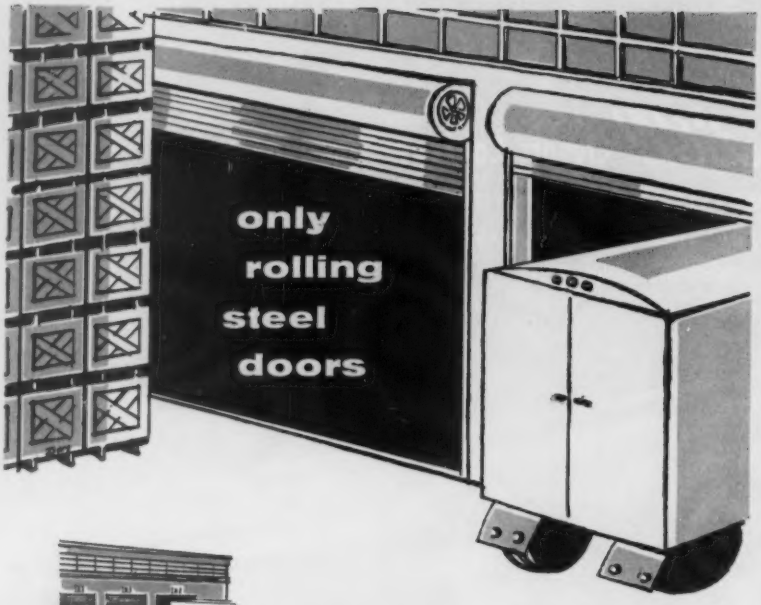

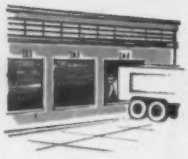

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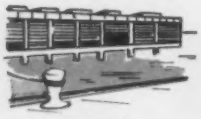

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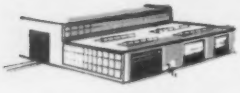

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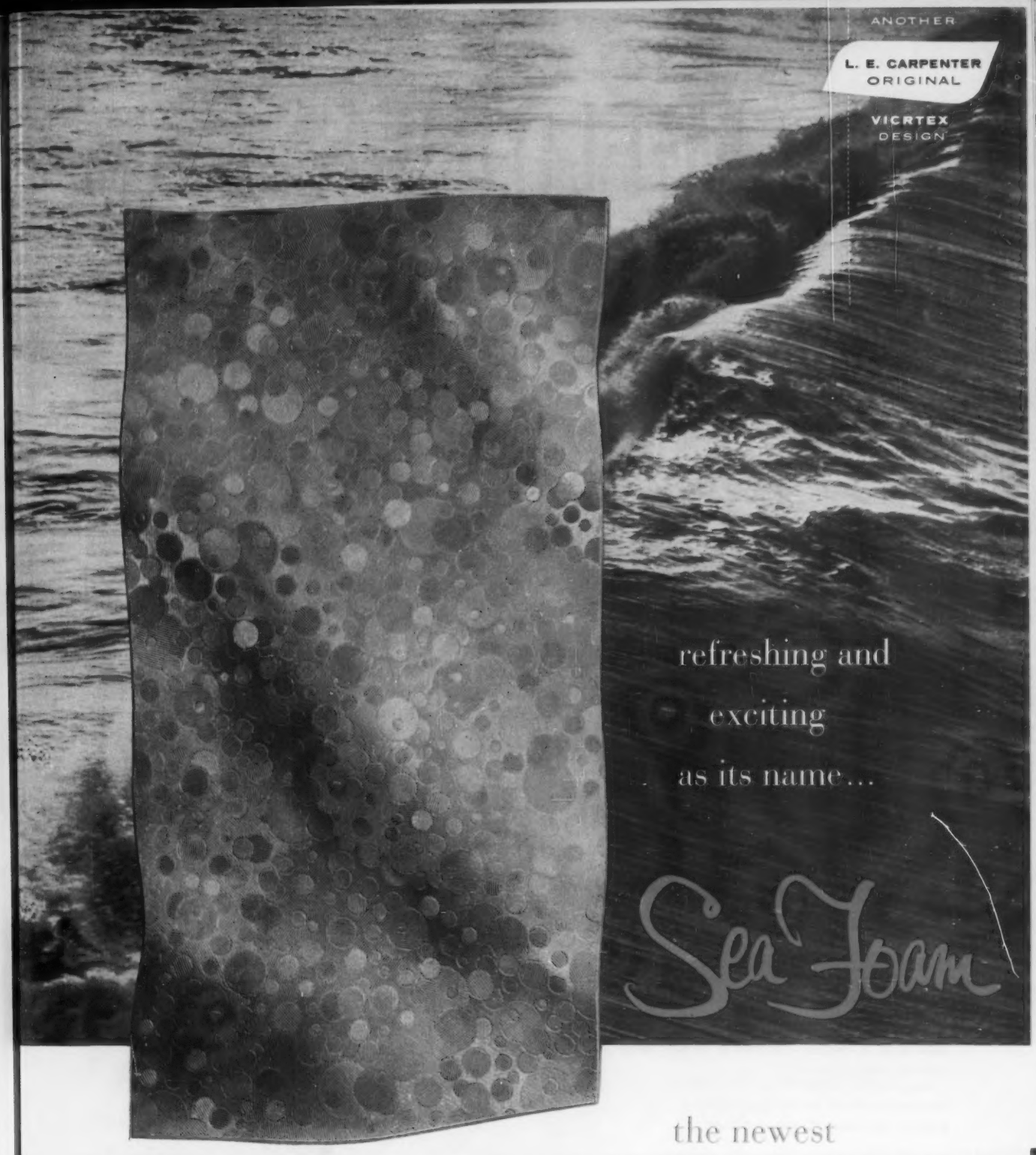

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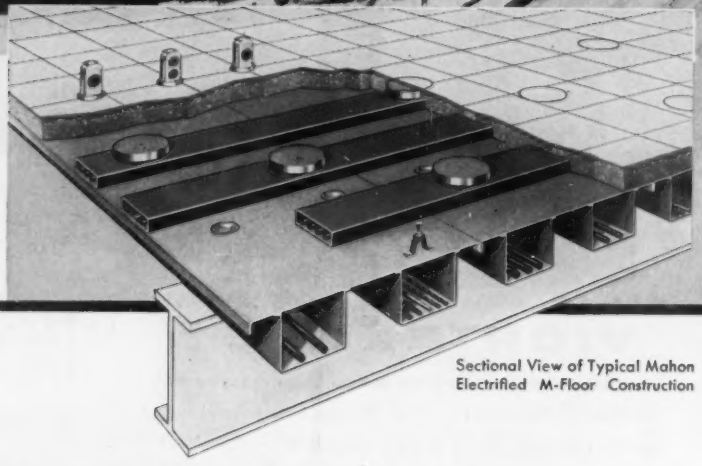

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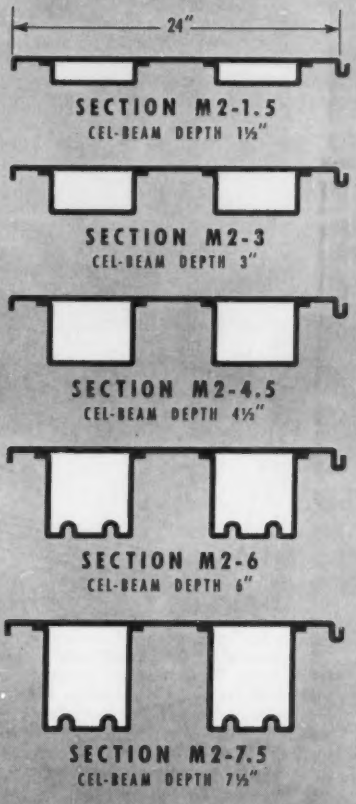

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As part of a general expansion program, the creation of a new Construction Products Division, to manufacture and market a line of building products for home building and light commercial industries, is announced by ADDISON PRODUCTS COMPANY.

expansion through purchase

SHAMPAINE INDUSTRIES, INC., announces its purchase of all of the outstanding, preferred, and common stock of HUBENY BROTHERS, INC., of Roselle, N. J., manufacturers of metal, industrial specialties, and assemblies. The company will retain its officers and name, and will operate as a subsidiary.

new subsidiary

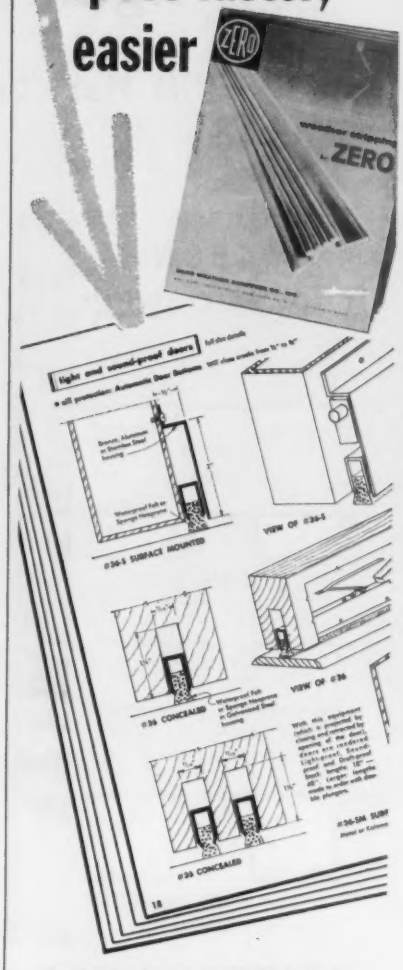
CABOT, CABOT & FORBES COMPANY, Boston, announce the formation of a new subsidiary to be known as CABOT, CABOT & FORBES ASSOCIATES, INC., for the practice of Architecture and Engineering.

ownership expansion

THORSHOV & CERNY, INC., Architects-Engineers, Minneapolis and St. Paul, have expanded ownership to include ten stockholders all of whom are active staff members of the firm. The company also announced a recently completed reorganization of its management staff in which FOSTER W. DUNWIDDIE, WILLIAM J. MILLER, and KENNETH R. WHITEHEAD were promoted to vice-presidents and JOHN G. COOK was named secretary-treasurer. Other promotions include: FRANCIS R. MEISCH to materials control manager, and RICHARD A. PETERSON to chief draftsman.

WILLIAM J. MILLER has moved to the firm's new St. Paul office at W-2781, First National Bank Building.

how to write your weatherstripping specs faster, easier



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Sprayolite Plaster cuts noise at new Reynolds Metals Building

Headquarters Office Building,
Reynolds Metals Co.,
Richmond, Va.

Construction Management:
EBASCO Services, Inc.,
New York, N.Y.

Architect:
Skidmore, Owings & Merrill,
New York, N.Y.

General Contractor:
George A. Fuller Co.,
Washington, D.C.

Plastering Contractor:
J. A. Wilton, Jr., and Brother,
Richmond, Va.

Everything about the new $11,500,000 headquarters office building of the Reynolds Metals Company spells beauty and comfort. Sunlight on the windows is regulated by huge metal louvers, controlled by the sun's rays. People move from floor to floor by spacious, comfortable moving stairs. And the general living and working noises are kept to a soft murmur by beautiful ceilings of Gold Bond Sprayolite Acoustical Plaster.

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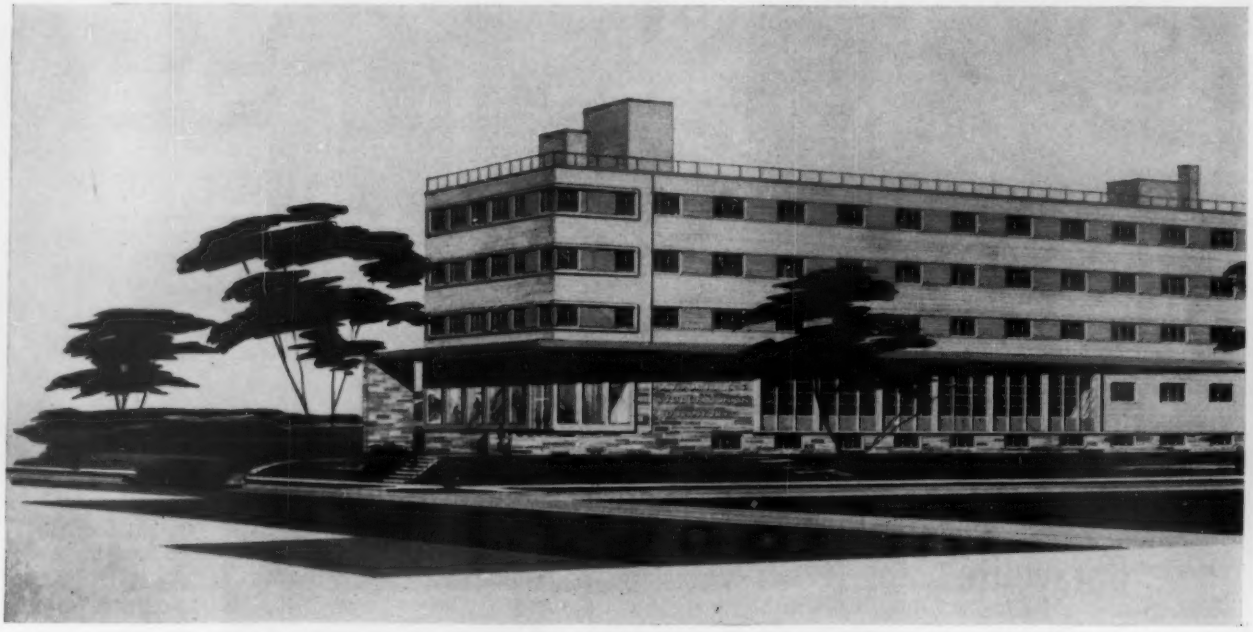

The architects who designed this new dormitory at D'Youville College anticipated some expansion and the problems that go with it. So wherever a restrained room partition meets a corridor beam, corridor partition, steel column or other structural surface, they designed a break in the plaster and installed Gold Bond® Metal Casing Beads as a relief. This ingenious use of Metal Casing Beads for expansion will relieve stresses within the partition and allow for thermal expansion and contraction.

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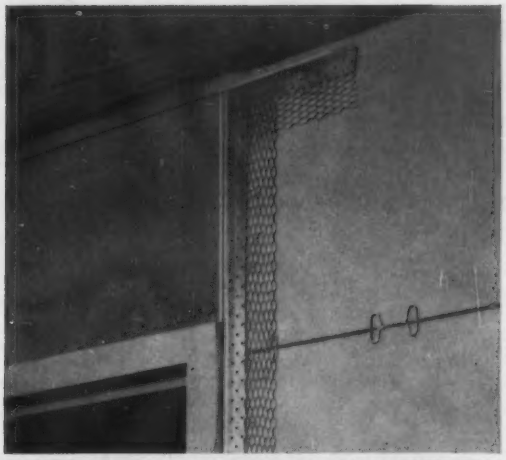
NATIONAL GYPSUM COMPANY, BUFFALO 13, NEW YORK

Bead

Foit & Baschnagel, Architects,
Buffalo, New York



Metal Casing Beads act as plaster terminals at the side of door bucks protecting the plaster from shocks and vibration caused by door slamming. Above the door, a second casing bead placed back to back forms an expansion joint. Casing beads are also used to separate wall plaster from ceiling.

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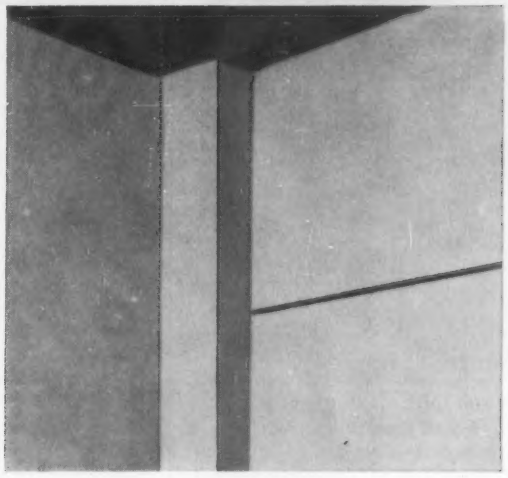

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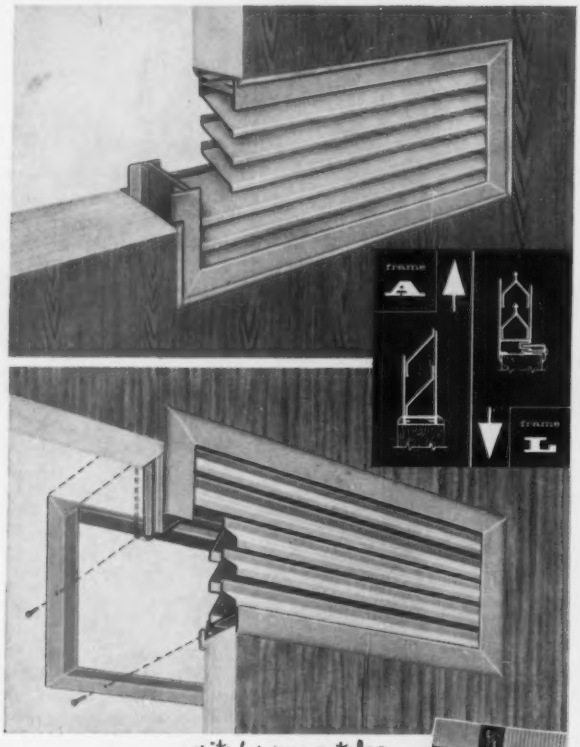

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1. The names and addresses of the publisher, editor, and managing editor are: Publisher, D. Brad Wilkin, 80 Devoe Rd., Chappaqua, N. Y.; Editor, Thomas H. Creighton, 321 E. 69th Street, New York N. Y.; Managing Editor, Charles Magruder, 325 East 57th Street, New York, N. Y.

2. The owner is Philip H. Hubbard, 2 Bon Mar Road, Pelham Manor, N. Y.; Profit Sharing Trust, 430 Park Avenue, New York 22, N. Y.; William P. Winsor, 400 East 52nd Street, New York 22, N. Y.; Fred P. Peters, 45 Forest Drive, Short Hills, N. J.; H. Burton Lowe, 17 Birchdale Lane, Flower Hill Estates, Port Washington, N. Y.; Merald F. Lue, Newtown Turnpike, R.F.D. 4, Westport, Conn.; Kathleen A. Starke, 266 Bedford Park Boulevard, Bronx 58, N. Y.; Gessner G. Hawley, 325 East 24th Street, New York, N. Y.; John F. LeViness, Jr., 10 Oak Street, Floral Park, Long Island, N. Y.; John Y. Cunningham, 412 East 55th Street, New York 22, N. Y.

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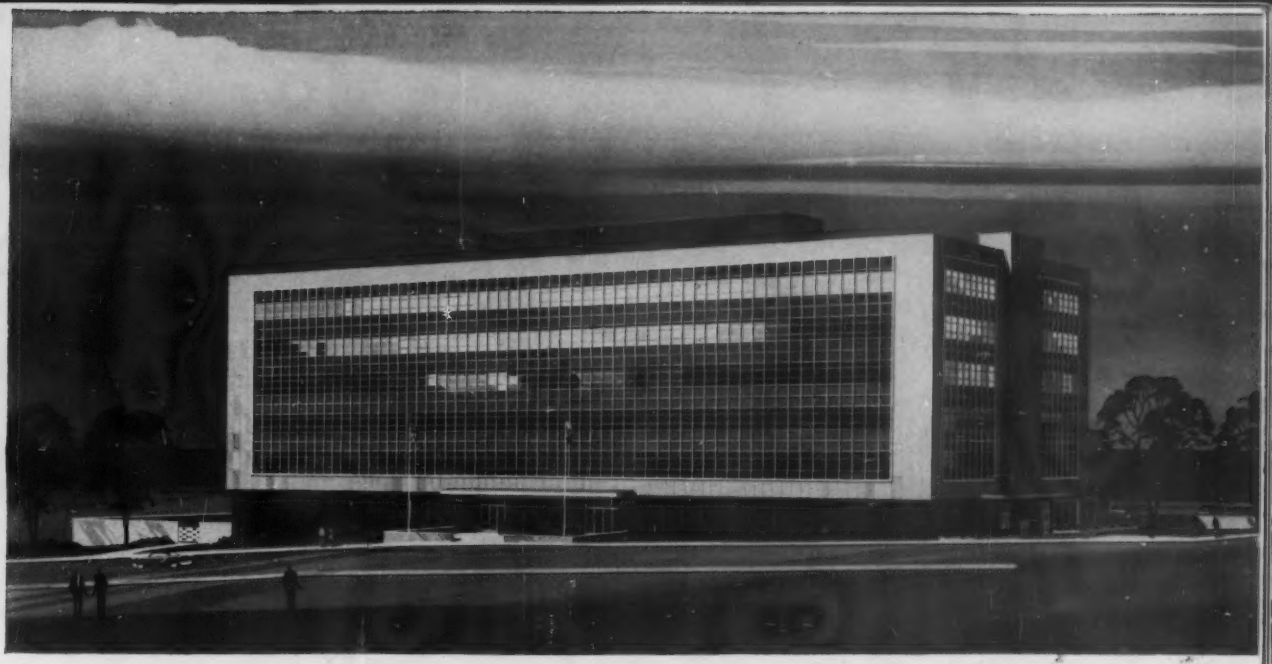
JOHN N. CARLIN,
Circulation Director.

Sworn to and subscribed before me this 9th day of September, 1959.
(SEAL)

KATHLEEN STARKE,
Notary Public.

(My commission expires March 30, 1960.)



Employment Security Building, Baltimore, Md. • **Architects:** Fenton & Lichtig, Baltimore • **Contractor:** Blake Construction Co., Inc., Washington, D. C. • **Hardware Supplier:** Albert Gunther, Inc., Baltimore

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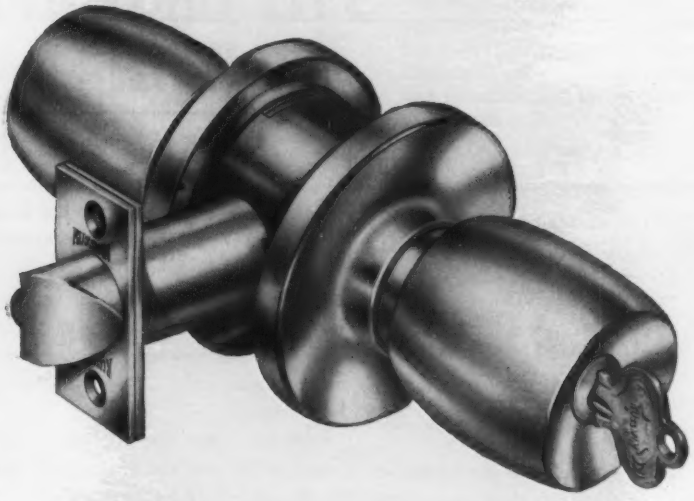

Impressive is the word for the handsome new Employment Security Building in Baltimore, Md. And indicative of the careful planning that went into it are Russwin Tempo design Stilemaker locksets. This smartly styled, heavy-duty doorware not only complements the building's modern architecture, but offers many features Russwin-engineered for long, trouble-free service. Ball bearing pin tumbler lock cylinders, for example, minimize lock wear. Extra-length knob shank bearings hold knobs rigid, rattle-free. Latch bolts with a full 5/8" throw provide positive security. Write for detailed information about Russwin's popular Stilemaker line. Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.

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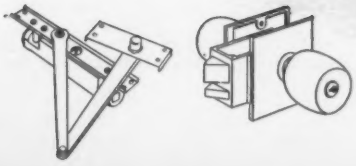

Russwin's "Top-railer" 500 Series Door Closers are used for dependable door control in the Employment Security Building. Rugged Russwin Unilocs are used on entrance doors.

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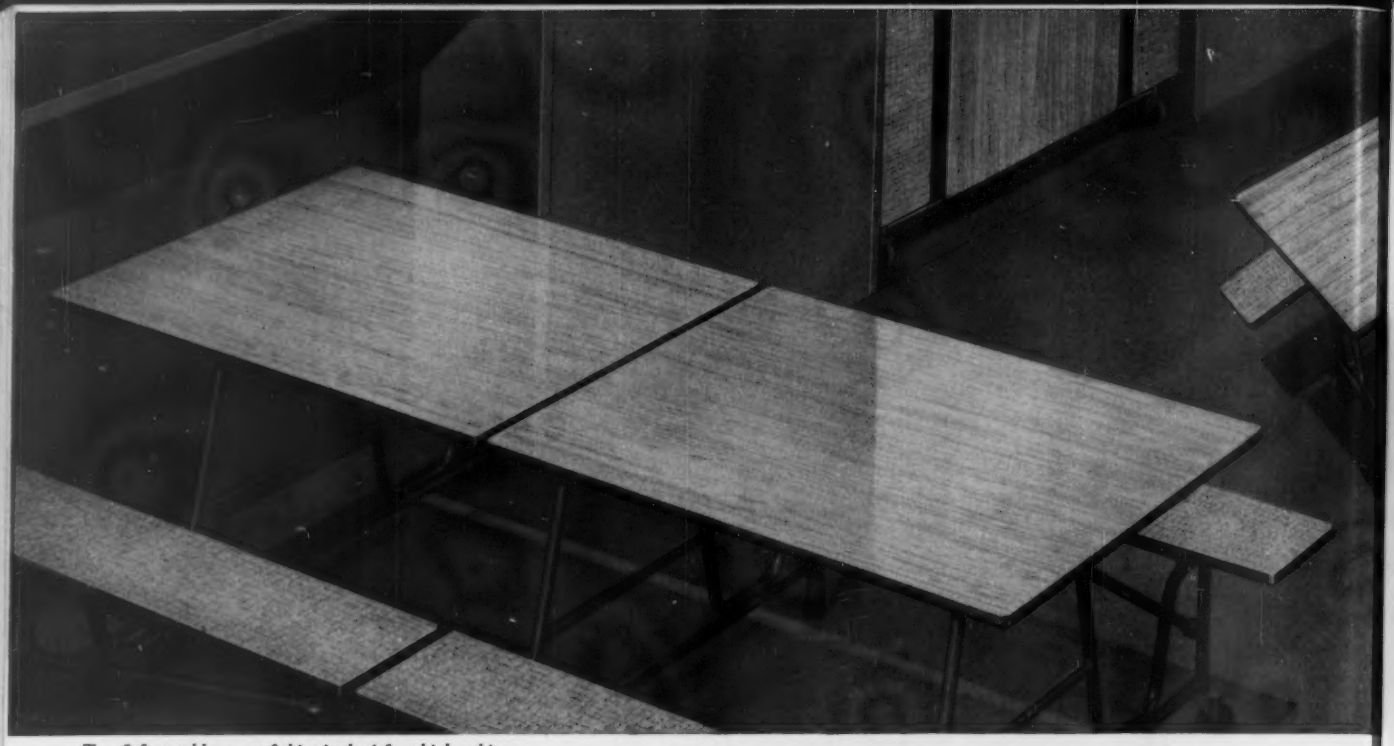

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notices

official name change

PRESSTITE-KEYSTONE ENGINEERING PRODUCTS COMPANY, Division of AMERICAN-MARIETTA COMPANY has had its name officially changed and will henceforth be known as the PRESSTITE DIVISION.

new addresses

PERCY D. BENTLEY & ESLEY D. HARDEN, ASSOCIATE, Architects, 56 Thirteenth Ave., W., Eugene, Ore.

WILFRED E. BLESSING, Architect-Landscape Architect, 3593 Stevens Creek Blvd., Santa Clara, Calif.

JOHN MARCUS HALLETT & WENDELL B. HALLETT, Architects, 200 Third St., S.E., Washington, D.C.

HERMAN S. DEISER, Architect-Freelance Writer, 390 Morrissee Ave., Haledon, Paterson, N. J.

elections, appointments

SAUL NEUFELD, appointed executive engineer in charge of the Miami office of SIDNEY W. BARBANEL, Consulting Engineer.

GRANVILLE ACKERMANN, appointed chief designer of interiors and exhibits for the design firm of BECKER & BECKER ASSOCIATES.

JAMES B. STEWART, elected vice-president of KEGLEY, WESTPHALL & ARBOGAST and will operate from firm's San Pedro office.

WILLIAM B. WINTERBOTTOM, elected a vice-president and director of product design for RAYMOND LOEWY ASSOCIATES, INC.

LEE HOOPER, appointed co-ordinating architect for the Tampa office of REYNOLDS, SMITH & HILLS, Architects-Engineers.

p/a views

(Continued from page 68)

Possibly Sylvester is right in labeling me a "Theorist"—if only in the sense that most of my structural types are still design possibilities but, in my view, so constructionally realistic that I spent considerable time during my present Etruscan retreat in reviewing their engineering economics with . . . a wishful eye to the market.

Probably Bruno Zevi is closer to what I think is the real aim of my work when he commented (JULY 1956 P/A) ". . . a stimulus to architectural invention. His structures cannot be defined simply in terms of engineering: they are hypothesis for new architectural forms . . . a multiplication of hypotheses which then may become practical and workable through the agency of an artist's imagination."

It is my misfortune that I have not

yet met such a congenial soul and, meanwhile, I had to use my own imagination in suggesting possible architectural expressions for most of my structures.

However, for some of my types, a well defined architectural form results from the suspenarch syllogistic conclusion of the structural dialectic; its own particular sensualism would be weakened if not completely distorted, should elements of planar plasticity or sculptural concepts be introduced in the treatment of exterior surfaces.

Such I believe is specifically the case of my structures in membrane on coacting ribs (JULY 1956 P/A) in which the inherent sensualism is produced by forms originating directly from mechanics as rationally applied in the study of the constructional frame.

PAUL CHELAZZI
Perugia, Italy

•

Dear Editor: There is a great need for an article of this sort at this time. It is a very comprehensive and comprehensible study dealing with an exuberant new movement I am happy to have been a part of for about five years now. The movement has developed in many directions, which you have done well to distinguish. I think every architect mentioned would not be adverse to being included under the broad title of "New Sensualism," as long as distinctions are made between his particular concern and that of others: for there is room here for great mutual disagreement and even antagonisms. Generally, you show fair respect both for examples of this movement to date and for what it might lead to in the near future. Also your criticisms of certain examples in the implicit dangers ahead are fair. My individual opinions and criticisms of these particular examples are all too easy to give, and would be, if I were called upon to do so.

I am proud to be included, even though "never heard of." A very timely and provocative article.

JOHN M. JOHANSEN
New Canaan, Conn.

•

Dear Editor: I have long felt that the architects who are experimenting in the plastic manner [should] be reminded that unless they are Le Corbusier (i.e.: accomplished painters, sculptors, and architects) it takes more than just the desire to change suddenly from the curtain-wall, or stripped-down building, to a sculptural approach.

You ask in your article whether *I*, along with other sculptors experienced in architecture "could work with architects in basic sculptural-form molding."

While I admit to having entertained the thought many times since the advent of the new "sensualism" (and have sometimes wondered why I have never been asked); I, for one, would be wary of attempting such a collaboration. With few exceptions, the artist in the past has had to enter into collaborations as a sec-

(Continued on page 341)

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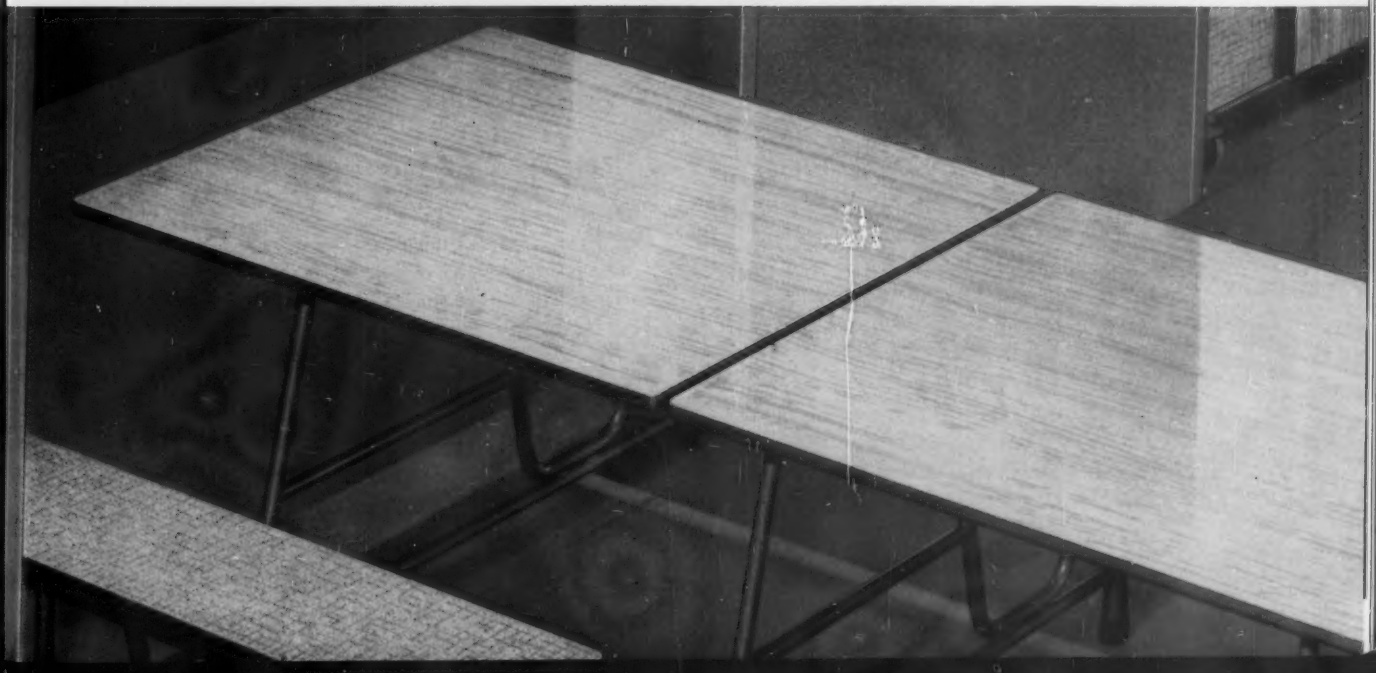
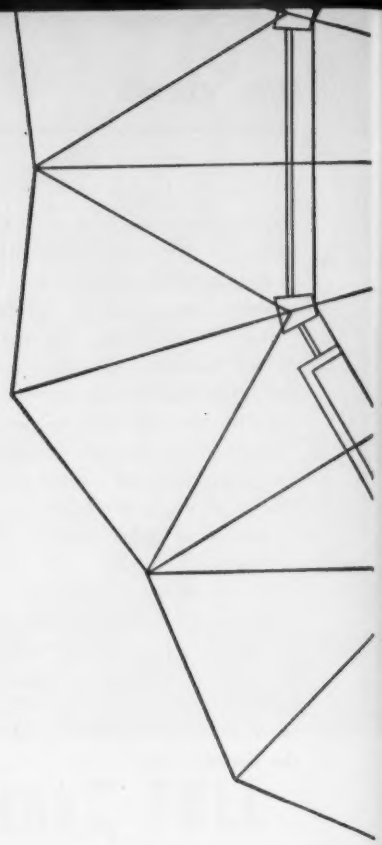
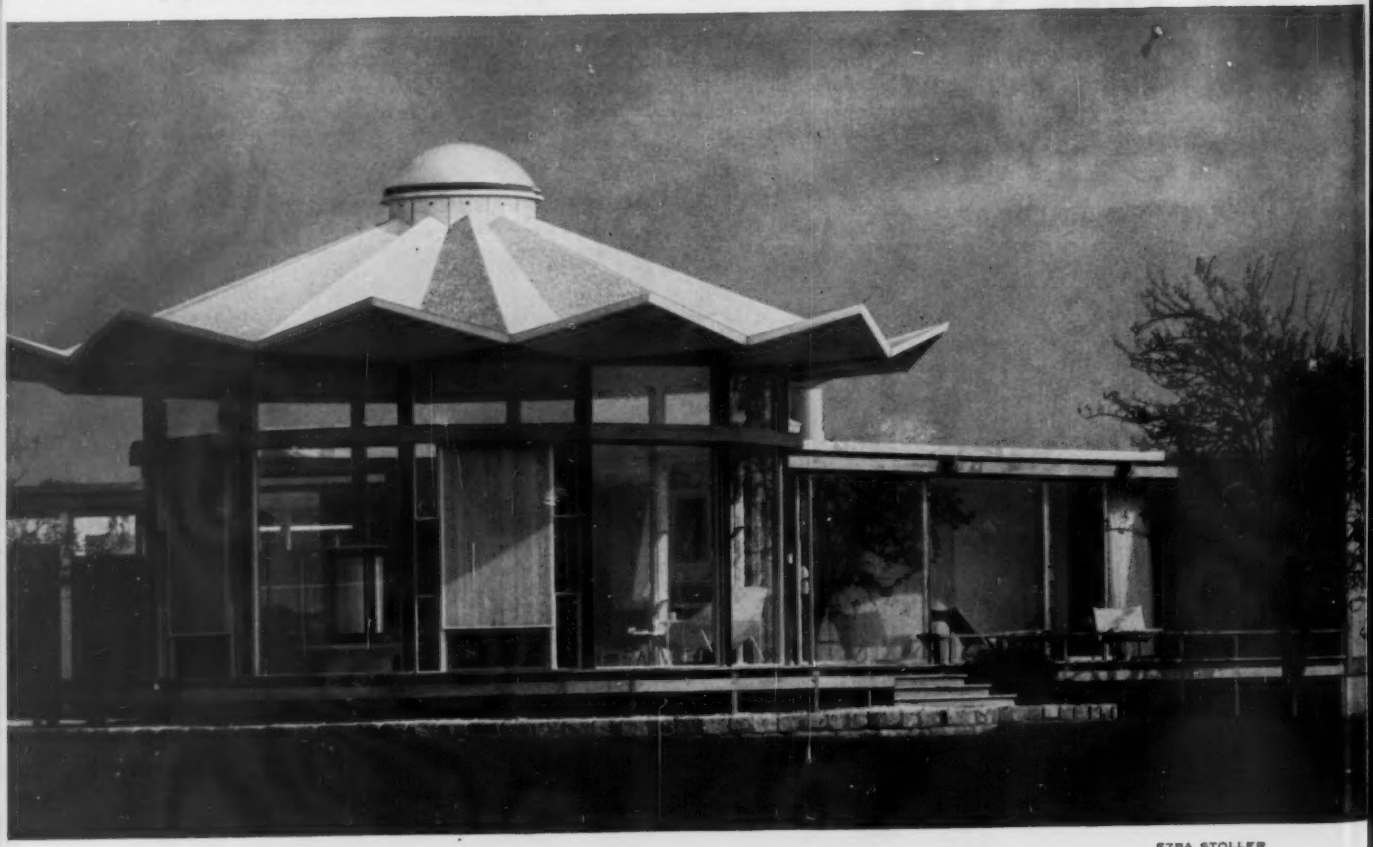
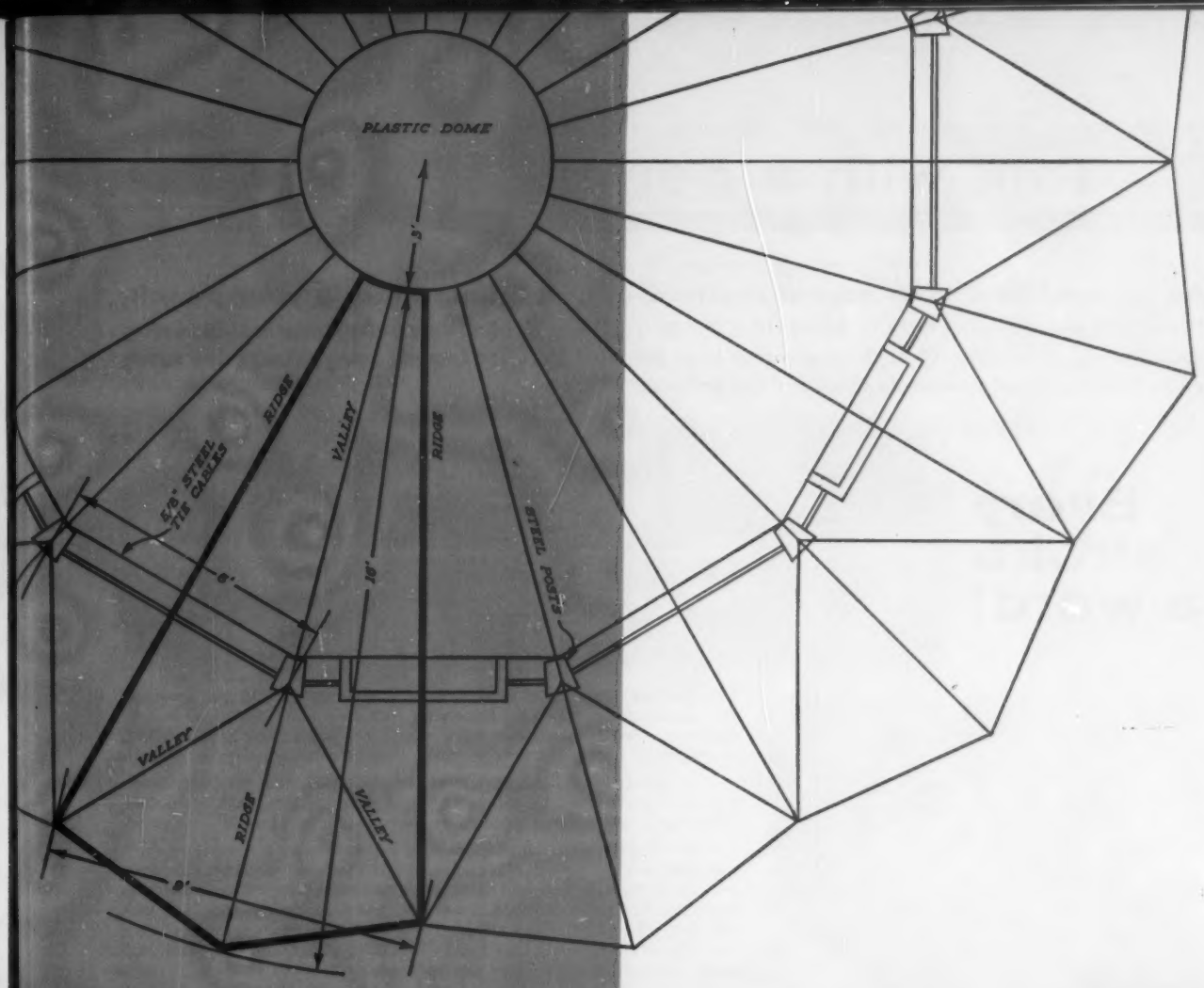


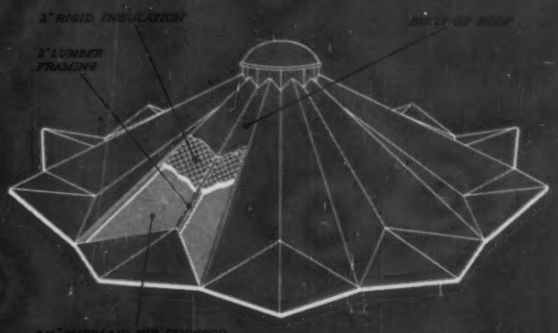


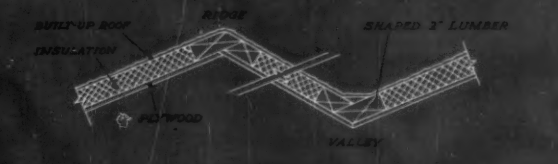
new approaches to structural design with fir plywood



EZRA STOLLER







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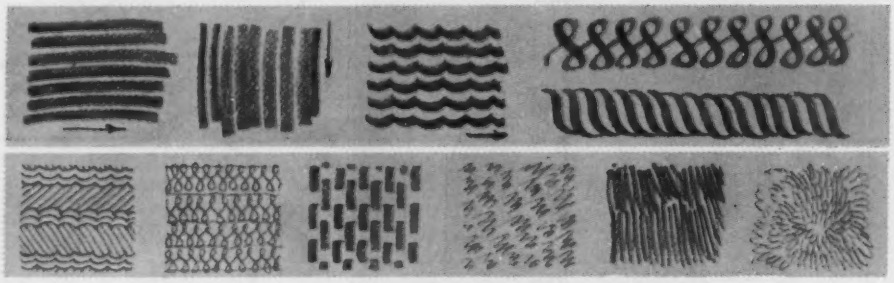

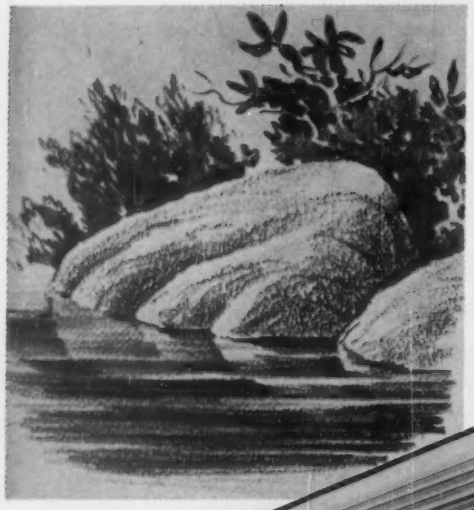

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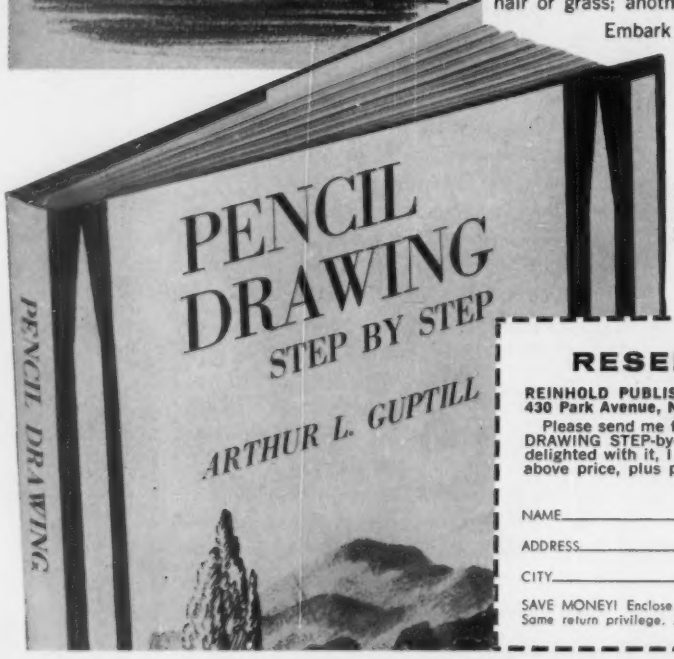

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p/a views

(Continued from page 237)

ond cousin, almost always into a predetermined plan, and in a few cases, an all-but-impossible situation.

Whether a possibility of closer collaboration (on an equal basis) could exist if the sculptor were asked to work on the basic design of the building, is questionable—but certainly possible.

I think, however, it is just as important to determine whether it is worthwhile to ask contemporary sculptors to work over the outmoded forms of "Dynamic Design" when for the most part, they have gone far beyond.

I agree that, for good or bad, this new movement is opening new areas to creative architecture which could be an enriching experience for all of us. But note, please, the difference between the strong, virile, and very contemporary sculpture of Ronchamp (a very close counterpart to sculpture today) and the casual attempt to merely develop a new fashion of new clichés.

If some architecture is tending toward sculpture, then at least let these architects see what is typical of today's sculpture. It is not only the school's problem, as you suggest; it could also be the responsibility of the architectural magazine to show what is contemporary in sculptural form—not that which is attached to buildings, but mainly exhibition sculpture, the work accomplished in the studio free of any and all limitations, for this is generally the work from which stems the shapes used later in architectural sculpture commissions.

Possibly, from this, American architects will find their own direction rather than thin-wall roofs of Byzantine arches, a lightened Gothic, or side glances at Candela and Nervi. There is a great creative drive currently in American sculpture. It could exist as inspiration and is available easily and conveniently in their own back yards.

I hope that my reaction, along with others, will culminate in a worthy discussion and a greater understanding of the problems of the architects and the sculptors, in the event such a collaboration should take place.

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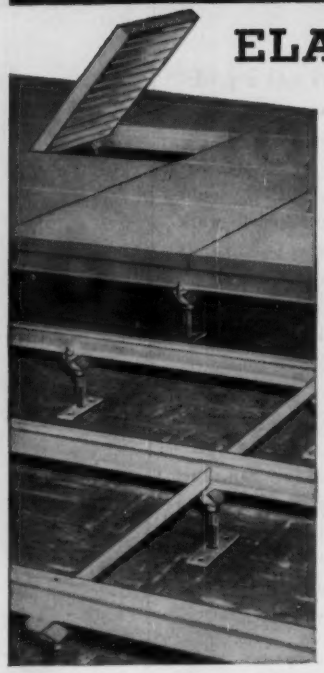

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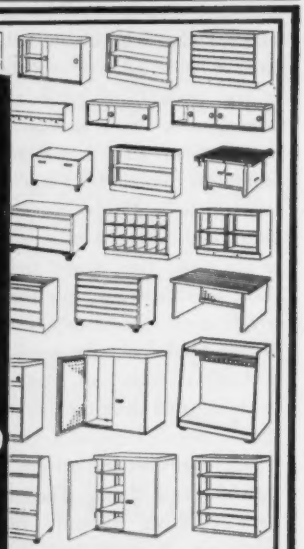

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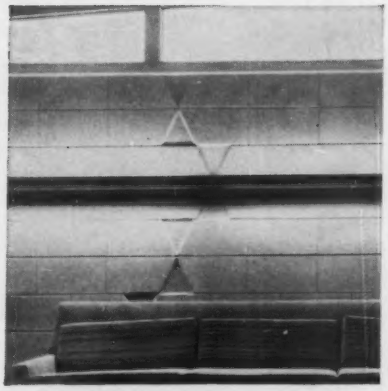

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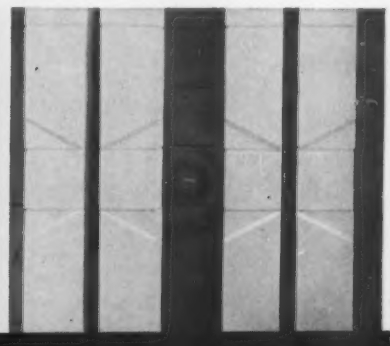

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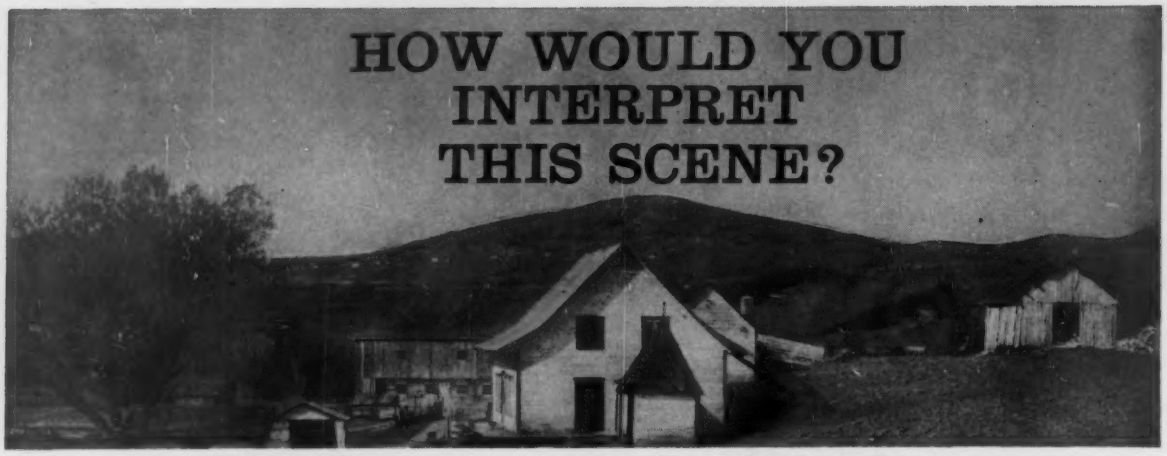

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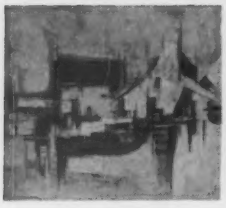

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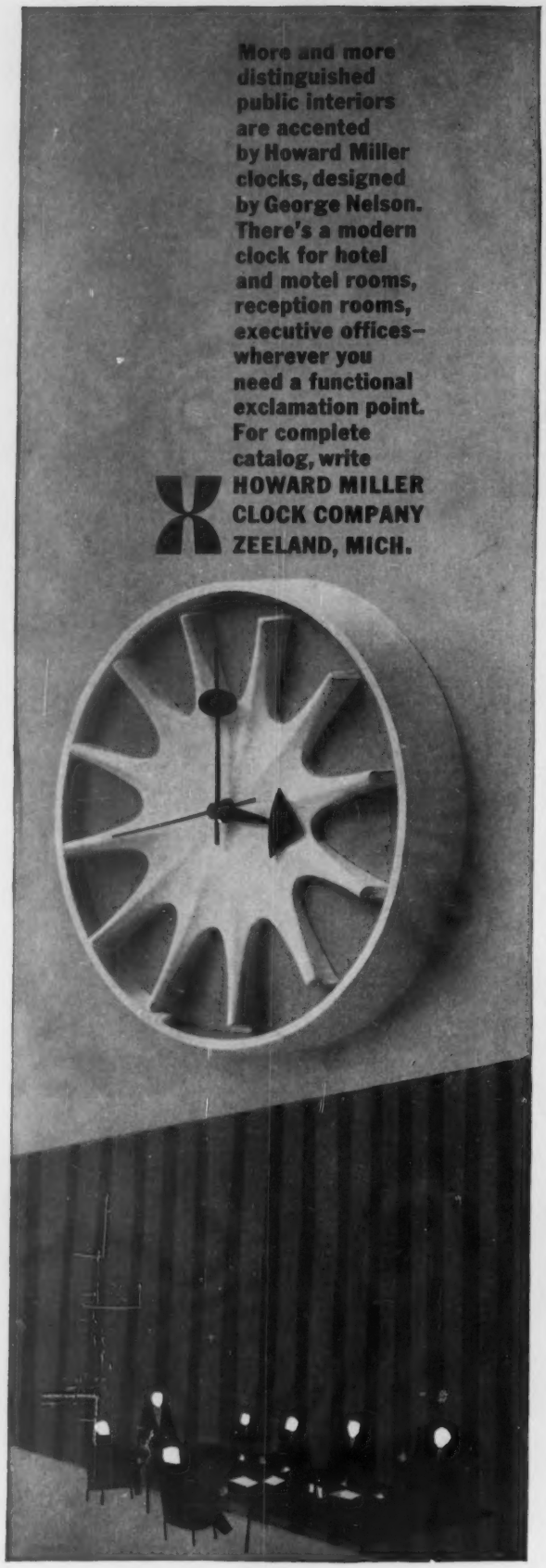
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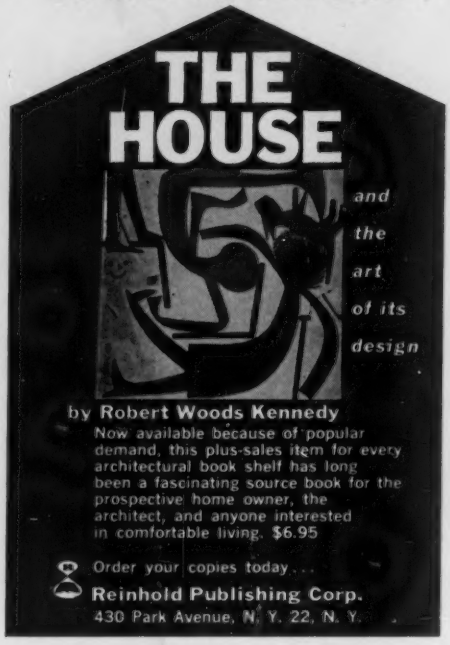
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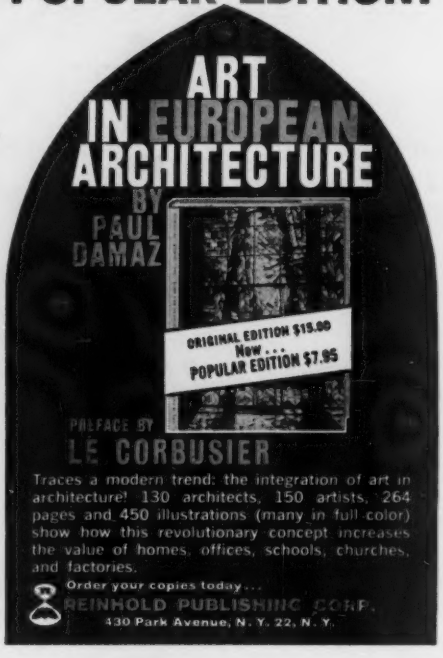
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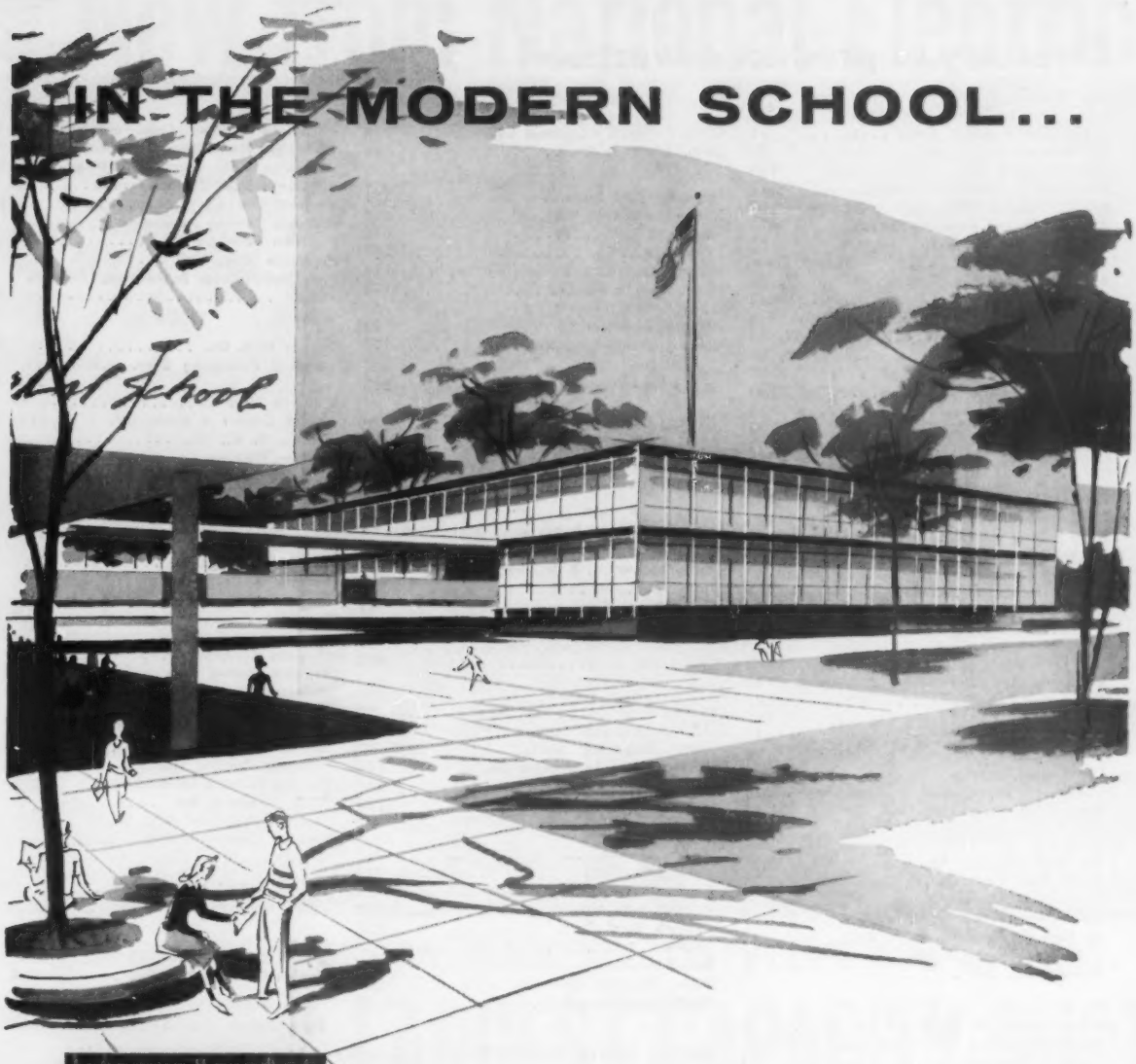

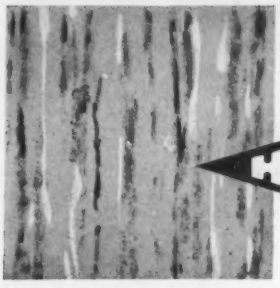

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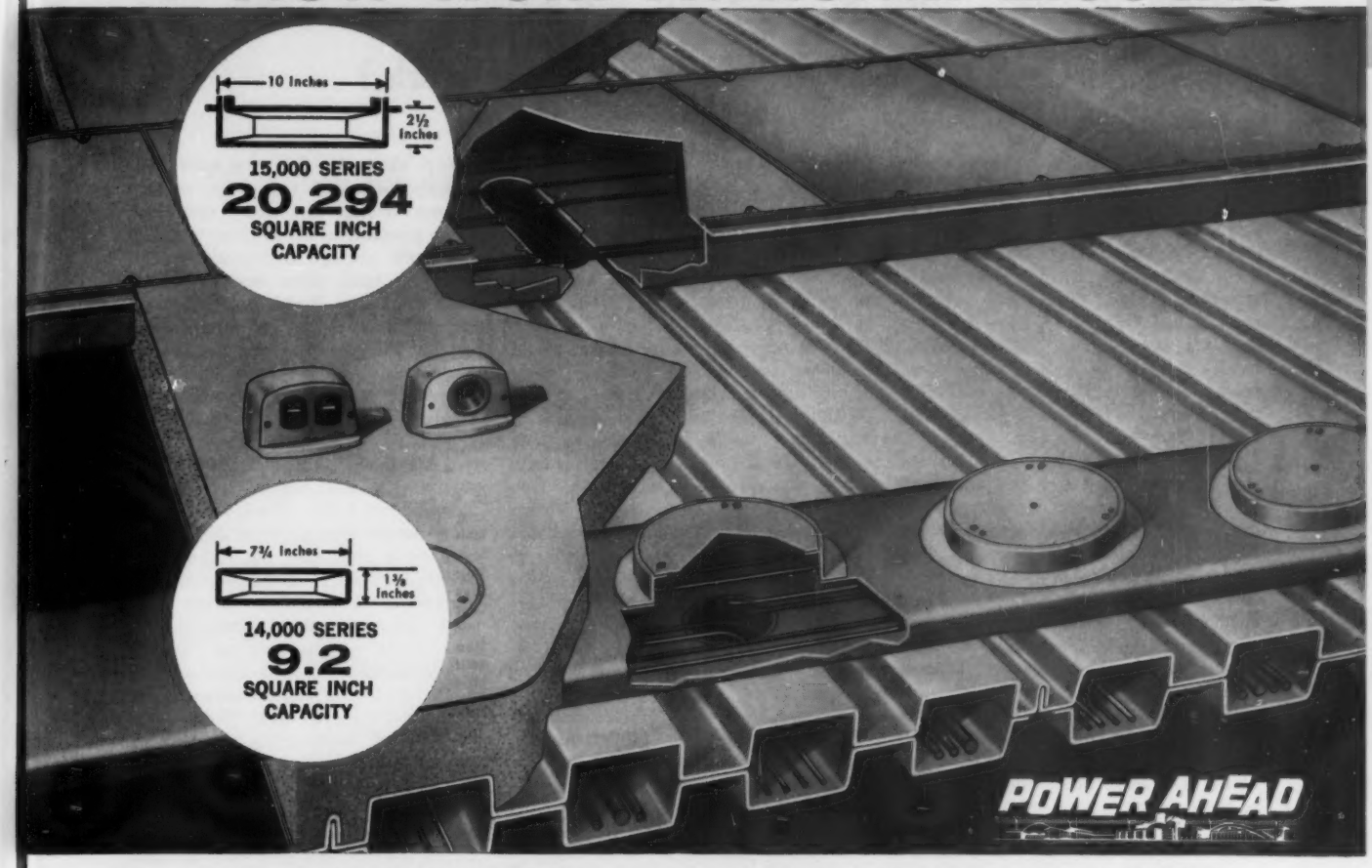

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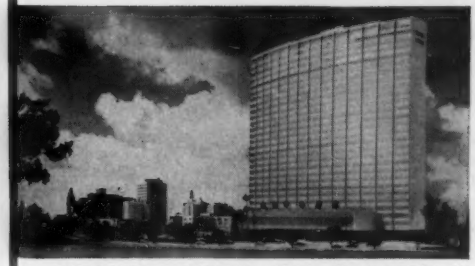

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P.S.

why not more good average work?

I remember writing a long while ago that wherever I traveled in the United States, discouraged local architects told me, "This is the most conservative part of the country; that's why you won't find much good contemporary architecture here." I am still told the same thing. On several trips this past month I was shown a great deal of mediocre work, along with one or two sparklers, and told that the clients in these particular localities just won't accept good design.

I'm sorry to have to say that I'm not too much impressed with this argument. I don't believe that clients are much different in Lexington, Grand Rapids, New York, Dallas, or San Francisco. Architects aren't much different either; they include some talented people with enough force to carry through their concepts; some talented people without that force, who have restricted practices; many good-hearted people who are easily led to compromise when the inevitable urge to do a more "acceptable" thing comes; and some people of limited ability who seek excuses for the quality of their work.

And wherever one goes it is still necessary to be led or directed to those few gems of architecture that the locality boasts. Up and down sidestreets until one comes on that church or that house or that hospital that "should be published"; past hundreds of other houses and office buildings and clinics and churches that even the local guide doesn't stop to comment about.

What occurs to me at these times is that the buildings we are passing—the "anonymous" architecture, so to speak—should be "good" in its own right also. One should pass more simply, well-integrated, consistently executed work that has no obvious flaws and is both pleasant to look at and satisfactory to use. Then it would not be necessary to pardon and excuse. But, instead, there are too many buildings well planned that flaunt bad uses of materials; there are interesting structural applications badly carried out in finished architecture; there are too many interesting plastic designs that cloak mal-functioning interiors.

Our editors sometimes wonder whether it is fatigue or over-exposure that makes us feel, after excursions and meetings in which we review submitted work, that there is all too little architecture being done that is consistently "good" in all parts, by commonly accepted standards. Several comments very similar, from people outside our editorial activity, have recently made me feel that we are not wrong; that average, typical work being done today is not as good as it should be.

There is, for instance, the inevitable yearly reaction of the Juries that judge our Design Awards Program entries. These hard-working people always end their deliberations with a warm feeling of gratitude to those architects who have given them stimulating work to look at and judge; and at the same time with a sense of discouragement at the bulk of the not-so-successful submissions. One year, Harry Weese said, after the Design Awards Seminars: "I think the thing that is significant is not the quality of the work we have been discussing today but the hundreds of projects which were submitted which you have not seen . . . about the work you didn't see—the five-sixths of the iceberg—we have no grounds to be complacent."

Another year, Dean Henry Kamphoefner remarked on "the rather shocking amount of mediocre work from so many offices, including some of the first-rate firms."

And this year Dean José Luis Sert, in a recorded bull session after the Jury had finished its work and was reviewing general impressions, said some important things about the average, non-genius architect. Rather than scolding or being discouraged, he pointed out the great value of *average quality*. "It's very important," he said, "that there be an effort to produce better, higher class, average architecture and a good group of average architects. I think this kind of architecture—which we consider, perhaps, the less exciting sort—was so important when it *was* good and correct and the proportions were pleasing that when you find it in the older parts of Boston and Philadelphia, for instance, you realize its tremendous value."

"I would say," he went on, "that the outstanding masterpieces that we view from time to time (very rarely and seldom appreciated in their own generation) wouldn't be the same if we didn't have the setting of this rather quiet, anonymous, correct, well-proportioned, honest architecture. It has in it a certain element of inspiration; honesty doesn't ban inspiration. It can be high-quality, anonymous, quiet design. Then sculptural excitement or unusual ability is an accident in the midst of that. If it isn't, it can become an element of chaos in the midst of chaos, and that is no good."

Another comment that seems to bear out our feeling that fully consistent, simple *goodness* is not as great a quality in today's average architecture as it might be, came from foreign visitors. David and Mary Medd, research architects for the Ministry of Education in London, have been touring the country with Commonwealth Fund Fellowships for the last year, looking at schools and talking to school architects and to educators. They end their trip with a somewhat dim view of U.S. school architecture (which they will explain for us in a later issue of P/A). Their complaint is not about the plastic, visual design quality of what they saw, but rather about the manner (or lack of manner) in which educational programs are being translated into architectural planning. Too much superficial architectural "design," they feel, and too little analysis of circulation, teaching arrangements, and so on. The run-of-the-mill work (the average, "anonymous" architecture that Sert was speaking of) in this specialized field seemed to them rather disheartening.

I was not unprepared for the Medds' reactions, because they had written to me during the year that they were becoming "so tired of the separation in peoples' minds of what a building looks like and what a building is!"

And it was interesting to me that in their search for a pleasing American architectural environment they also turned, as Sert did in his examples of "honest, anonymous" architecture, to some of the older cities. "The buildings we saw in Annapolis, Charlottesville, Williamsburg, Charlestown, New Orleans, and Monterey, to name only a few, gave us intense pleasure . . . the Garden District in New Orleans, those wonderful 18th Century churches in New Mexico, and the barns we have seen in Georgia, California, and the Pacific Northwest make one wonder whether the proportion of iconoclasm to development is not too high."

Coming back to my starting point: perhaps my self-conscious hosts on several recent trips would have been happier (I would have been) to be able to show me "honest, anonymous" development, rather than to apologize for lack of iconoclasm.

Thomas H. Creighton

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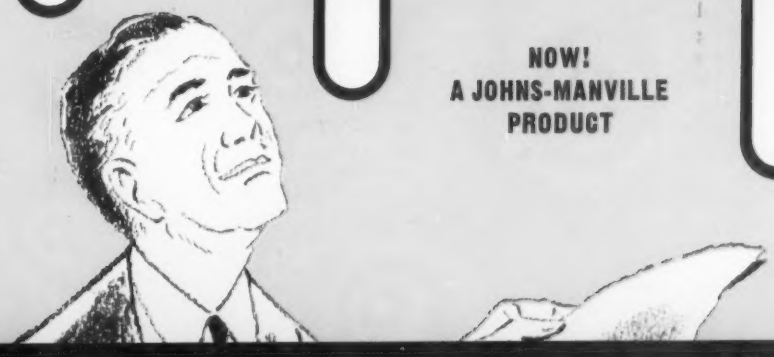

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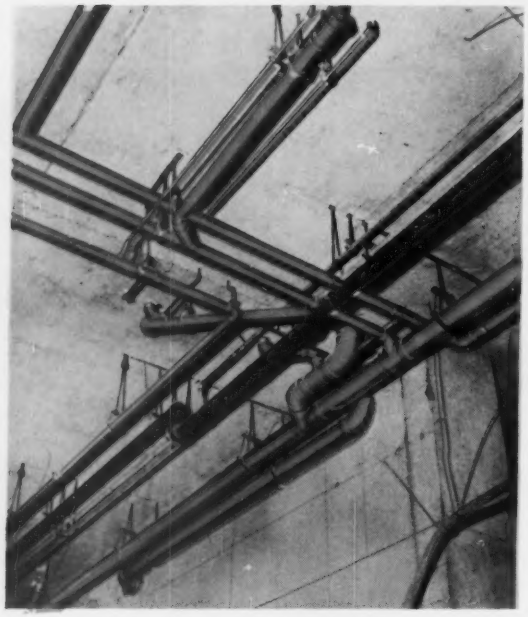

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